

ASIA WITHOUT BORDERS

NO. 114  
ISSUE 5/2015

# ASIAN Geographic™

## Extreme *Asia*

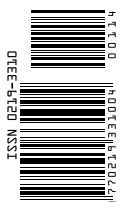
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High priestess of the wild  
When Nature calls

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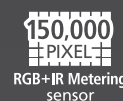
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# The Call Of *The Wild*

(AN EXCERPT)

By Robert William Service



JUSTIN ONG

Have you gazed on naked grandeur where there's nothing else to gaze on,  
Set pieces and drop-curtain scenes galore,  
Big mountains heaved to heaven, which the blinding sunsets blazon,  
Black canyons where the rapids rip and roar?  
Have you swept the visioned valley with the green stream streaking through it,  
Searched the Vastness for a something you have lost?  
Have you strung your soul to silence?  
Then for God's sake go and do it;  
Hear the challenge, learn the lesson, pay the cost.

Have you wandered in the wilderness, the sagebrush desolation,  
The bunch-grass levels where the cattle graze?  
Have you whistled bits of rag-time at the end of all creation,  
And learned to know the desert's little ways?  
Have you camped upon the foothills, have you galloped o'er the ranges,  
Have you roamed the arid sun-lands through and through?  
Have you chummed up with the mesa?  
Do you know its moods and changes?  
Then listen to the Wild – it's calling you.

---

**ROBERT WILLIAM SERVICE** (1874–1958) was a prolific writer and poet, who published numerous collections of poetry during his lifetime, including *Songs of a Sourdough* or *Spell of the Yukon and Other Verses* (1907), which went into 10 printings its first year, *Ballad of a Cheechako* (1909) and *Ballads of a Bohemian* (1921), as well as two autobiographies and six novels. Several of his novels were made into films, and he also appeared as an actor in *The Spoilers*, a 1942 film with Marlene Dietrich.



The logo for 'Asian Geographic Images of Asia' is displayed on a dark green background. The word 'ASIAN' is in a small, white, sans-serif font at the top left. Below it, 'Geographic' is written in a larger, white, serif font. The word 'images' is in a large, bold, white, italicized sans-serif font. Below 'images', the word 'of' is in a small, white, italicized serif font. The word 'asia' is in a large, white, stylized, italicized sans-serif font. To the right of the text, there is a cluster of white circles of various sizes, resembling bubbles or a stylized sunburst.

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Our mission is to conserve Asia's natural heritage, spread geographic knowledge and inspire people to protect our planet.

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## EDITORIAL

### PUBLISHER/EDITORIAL DIRECTOR

John THET • [thet@asiangeo.com](mailto:thet@asiangeo.com)

### SENIOR EDITOR

Lunita S V MENDOZA • [lunita@asiangeo.com](mailto:lunita@asiangeo.com)

### CONTRIBUTING EDITOR

Ian SELDRUP • [ian@asiangeo.com](mailto:ian@asiangeo.com)

### PHOTOJOURNALIST

Justin ONG • [justin@asiangeo.com](mailto:justin@asiangeo.com)

## ADVERTISING & MARKETING

### MARKETING MANAGER (EVENTS/MAGAZINES)

Felicia LIU • [felicia@asiangeo.com](mailto:felicia@asiangeo.com)

### MARKETING EXECUTIVE (EVENTS/MAGAZINES)

Wing Tong LO • [wingtong@asiangeo.com](mailto:wingtong@asiangeo.com)

### ADVERTISING SALES MANAGER

Karter LEE • [karter@asiangeo.com](mailto:karter@asiangeo.com)

## DESIGN

### SENIOR DESIGNER

Justin ONG • [justin@asiangeo.com](mailto:justin@asiangeo.com)

### CONTRIBUTING DESIGNER

Zoey LIM • [zoey@asiangeo.com](mailto:zoey@asiangeo.com)

## CIRCULATION

### SENIOR CIRCULATION/DISTRIBUTION MANAGER

Victor OW • [victor@asiangeo.com](mailto:victor@asiangeo.com)

### MARKETING/CIRCULATION REGIONAL MANAGER

Lauren HARRIS • [lauren@asiangeo.com](mailto:lauren@asiangeo.com)

### MARKETING/CIRCULATION MANAGER

P. PANIR • [panir@media-group.com.sg](mailto:panir@media-group.com.sg)

## FIELD EDITORS

YD BAR-NESS • Australia

Dr Rachel EINAV • Israel

## SCIENTIFIC ADVISORS

Dr Simon POLLARD

Dr Doug FENNER

Dr Nicolas J PILCHER

Dr Dionysius SHARMA

Dr Carl GRUNDY-WARR



Editorial Submissions • [editor@asiangeo.com](mailto:editor@asiangeo.com)

Subscriptions • [subscribe@media-group.com.sg](mailto:subscribe@media-group.com.sg)

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As the world's greatest democracy starts to enjoy its first true taste of economic prosperity, the income gap between the rich and poor has never seemed wider. India's poorest lack even the most basic necessities, with almost half of the country without access to a latrine. With the help of government subsidies, Indians themselves are being asked to "Clean India" and eradicate a source of abuse and disease.

BY ZIGOR ALDAMA

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##### An alternative measure of mountain height

To study Earth's vertical relief is to marvel at the world's most incredible geographical features – not just its highest mountains, but also its deepest ocean trenches. While altitude figures allow us to compare the absolute heights of the peaks, the more instructive measure of prominence provides an interesting new perspective that gives us greater insight into the planet at its most extreme.

BY YD BAR-NESS

### OCEAN

#### 48 Black Water

##### Cambodia's first UXO dive team starts to make rivers safe

Pol Pot's murderous Khmer Rouge regime left a terrible legacy for which Cambodians are still paying the price – in lost limbs and lost lives. But unexploded ordinance doesn't just maim and kill on land; underwater it poses an equally appalling threat that local dive teams, with the help of special training by ex-US Navy divers, are now beginning to neutralise.

BY ROBERT CARMICHAEL



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Please recycle.



FEATURES



FEATURE

56 **Megasapiens**  
**Towards the extreme city**

If there is any doubt as to the formidable scale of our achievements as a species, *Homo sapiens*, one need only look toward the awesome skylines that define our most populous and most extreme cities. Today’s metropolises are the result of thousands of years of technological development, allowing villages to become towns, towns to become cities – and “sapiens” to become “megasapiens”.

BY YD BAR-NESS

FEATURE

72 **The Indian Countryside**  
**Collects Its Debts**  
**Dried out heartbreak**

With both droughts and floods plaguing rural areas of India, the pressure on farmers is leading tens of thousands to consider making the ultimate sacrifice: suicide. Overwhelmed by the scale of this epidemic, the government can only provide grieving widows and their children a cash payout, but this is only serving to provide an incentive to desperate farmers struggling at the poverty line.

BY ZIGOR ALDAMA

ON ASSIGNMENT

80 **Extreme Asia**  
**Top 10 most intense**  
**places in the world**

The incredible diversity found in Asia is not limited to its long heritage and plethora of cultures. This vast region is also home to the world’s most extreme geography and manmade structures. From the lowest point on Earth, we soar to the highest summit, and discover far-flung locations of the world that claim the titles of coldest, hottest, driest and deepest.

BY JENIFER YEO



# { EDITOR'S NOTE }

David Lefranc/Corbis



“Nothing makes the Earth seem so spacious as to have friends at a distance; they make the latitudes and longitudes.”

— Henry David Thoreau

◆ ◆ ◆

*Extreme* has certainly been a way of life living the pages of *ASIAN Geographic*. Close to seven years on, I take my leave from this challenging title to scale greater heights and dive deeper into what else life has to offer. It is rather apt to end this journey with *ASIAN Geographic's* Extreme Edition, itself a reflection of how my team has always treated each story within these pages, perpetually pursuing the truth, when history constantly seems to favour the victors. *ASIAN Geographic* has searched the silent chasms, to cajole some of the greatest stories to light; displaying the weight of Asia's contribution to everything the world has known and taken for granted. Just because we personify subtlety, gentleness and grace, does not mean we lack fierceness and fortitude. There is a new wave flowing through this diverse and alluring region, a pride unseen for centuries and a voice found that cannot be silenced again.

I take with me this very pride, deep rooted in one of the longest histories of man and share an indescribable bond with my fellow Asians. Yet, in the end, we editors just pass through. We all know that you, the readers, are the real carriers of this proud flame. May it give you infinite courage moving forward, while constantly keeping one eye on the wisdom of our forefathers, in true Asian tradition.

Salam, shalom, om shanti...



*ASIAN Geographic's* editor received the prestigious Editor of the Year award at the 2011, 2012 & 2014 MPAS Awards.

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### MEDIA CORRESPONDENTS

ASIA	INDIA, SRI LANKA RMA Media, Faredoon KUKA • <a href="mailto:india@AsianGeo.com">india@AsianGeo.com</a> NEPAL, BANGLADESH Media South Asia (P) Ltd • <a href="mailto:nepal@AsianGeo.com">nepal@AsianGeo.com</a> MALAYSIA Kennedy THALAYAN • <a href="mailto:malaysia@AsianGeo.com">malaysia@AsianGeo.com</a> Theresa THAM (East Malaysia) • <a href="mailto:theresa@AsianGeo.com">theresa@AsianGeo.com</a> THAILAND Radius • <a href="mailto:thailand@AsianGeo.com">thailand@AsianGeo.com</a> AUSTRALIA Publicitas Australia Pty Ltd, Charlton D'Silva • <a href="mailto:cdsilva@publicitas.com">cdsilva@publicitas.com</a> CHINA Hainan Periscope Social Media Company • <a href="mailto:china@AsianGeo.com">china@AsianGeo.com</a> JAPAN Keiichi ARANTANI • <a href="mailto:japan@AsianGeo.com">japan@AsianGeo.com</a> RUSSIA Andrey BIZYUKIN • <a href="mailto:russia@AsianGeo.com">russia@AsianGeo.com</a>
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N. AMERICA	NORTH AMERICA Matt WEISS • <a href="mailto:america@AsianGeo.com">america@AsianGeo.com</a>

### OTHER ASIAN GEOGRAPHIC MAGAZINES PTE LTD PUBLICATIONS:



*ASIAN Geographic* is published every 45 days by Asian Geographic Magazines Pte Ltd 20 Bedok South Road, Singapore 469277 • SINGAPORE Tel: +(65) 6298 3241 Fax: +(65) 6291 2068 • Email: [info@AsianGeo.com](mailto:info@AsianGeo.com)  
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## MAIL



Dear Editor,

I am in love with *ASIAN Geographic*'s PASSPORT section and look forward to the two fascinating stories every issue. It is truly a step up from so many travel magazines. It's heartfelt and truly an experiential read every time. **Every story gives me an insight into a destination I think I know and then "bam!", I am hit by the chance to see it with new eyes – through the eyes of a local.** It gives me so much that I would never have received as the everyday tourist. This is truly the brainchild of a visionary, the future of travel publishing. Thank you.

**RUSSELL SULLIVAN, SYDNEY, AUSTRALIA**



Dear Editor,

I love that *ASIAN Geographic* has a humanitarian issue every year. I buy that issue and wait for it until next year. It's great to give back to humanity when we take so much every day. It warms my heart to read and re-read the Editor's Note each time I get the issue to find inspiration for charity and remind myself of the importance of love for our fellow human beings. Another great issue for 2015.

**ADELINE MOK, SINGAPORE**



Dear Editor,

I came across the *ASIAN Geographic*'s Singapore Special (No. 113 Issue 4/15) and was shocked at the number of things I didn't know as a Singaporean. I love the way *ASIAN Geographic* treats all its stories. I didn't think your Singapore Special would be any different from the rest of the magazine and just flipped it to pass the time in the bookshop. I ended up buying about four copies for family and friends as an SG50 gift. Thanks!

**PETER WEE, SINGAPORE**

Dear Editor,

I love Singapore! What a great celebration in your SG50 Edition (No. 113 Issue 4/15). It's my coffee table read this year and all who visit me try to steal it! I have found new spirit in being patriotic. I am a Malaysian, but Singapore has been my home for decades, from a student to a working adult. It has been good to me. Thank you *ASIAN Geographic*; thank you Singapore.

**SIMON TAN, KL, MALAYSIA**



**ASIAN Geographic would love to hear from you. Write us at [info@asiangeo.com](mailto:info@asiangeo.com)!\***

\*Letters may be edited for clarity and length

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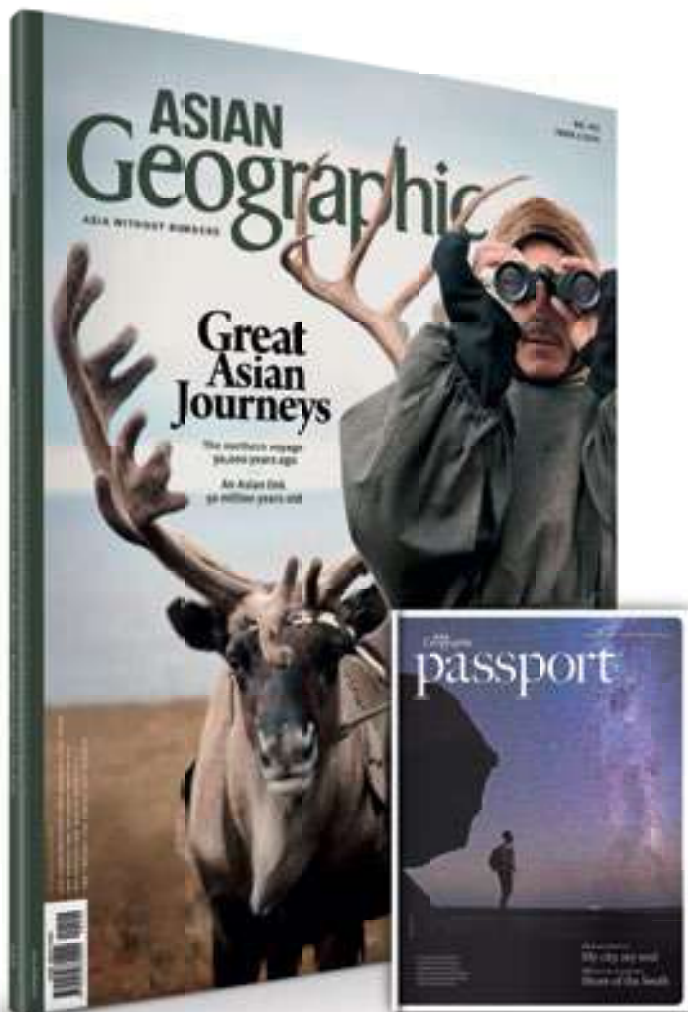
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*ASIAN Geographic Issue 1/2014*



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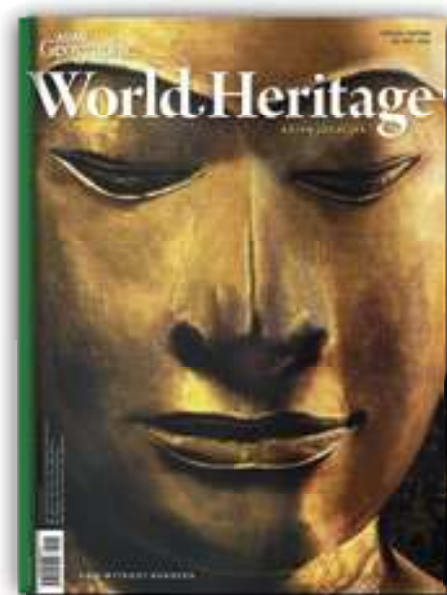
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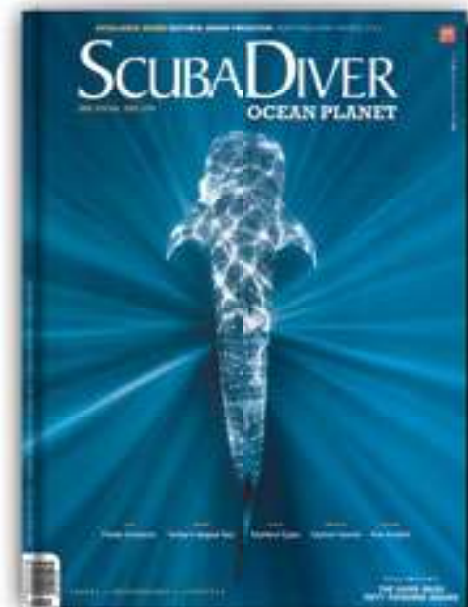
**THE ASIA DIVE EXPO**

ADEX 2014

**SPECIAL INTEREST**  
**MEDIA OF THE YEAR**

Merit

*Scuba Diver OCEAN PLANET*







# Consummate Coolness

ARCTIC WANDERER: HIGH PRIESTESS OF THE WILD





---

**Text** Lunita S V Mendoza

**Photos** Courtesy of Global Arctic Awards

The will to survive has never been more apparent among the indigenous peoples of the Arctic, those who have conquered the devastating beauty of this intense landscape and thrived for thousands of years.











**OPENING SPREAD** Sledding in East Greenland: The island Ammassalik, where the Inuit population still uses dogs to get to places to hunt and fish

**ABOVE** Kindergarten class? Penguins of South Georgia, a remote and inhospitable collection of islands, consisting of South Georgia and a chain of smaller islands known as the South Sandwich Islands









**ON SPREAD** The Baikalian waters at Listvyanka, Russia, where the air temperature is  $-40^{\circ}\text{C}$

**NEXT SPREAD** Night rendezvous in Russia's Komi Republic, in the northern Urals

Masters of their terrain, they are the only true explorers and adventurers who have earned their right to flourish in this unique environment. Come winter, the wretched magnificence is amplified and through the lens of dedicated – and somewhat crazy – photographers, and we are privileged to experience a world we would otherwise never encounter.

Archaeologists and anthropologists have come to believe that people have lived in the Arctic for as long as 20,000 years. The Inuit in Canada and Greenland, and the Yupik, Iñupiat and Athabaskan in Alaska, are just a few of the groups that are native to the Arctic.

Much of the Arctic population today lives in modern towns and cities, not unlike their neighbours to the south. The main employment industries for foreigners and locals alike are extracting oil and gas from rich deposits beneath the permafrost, working in tourism or conducting research.

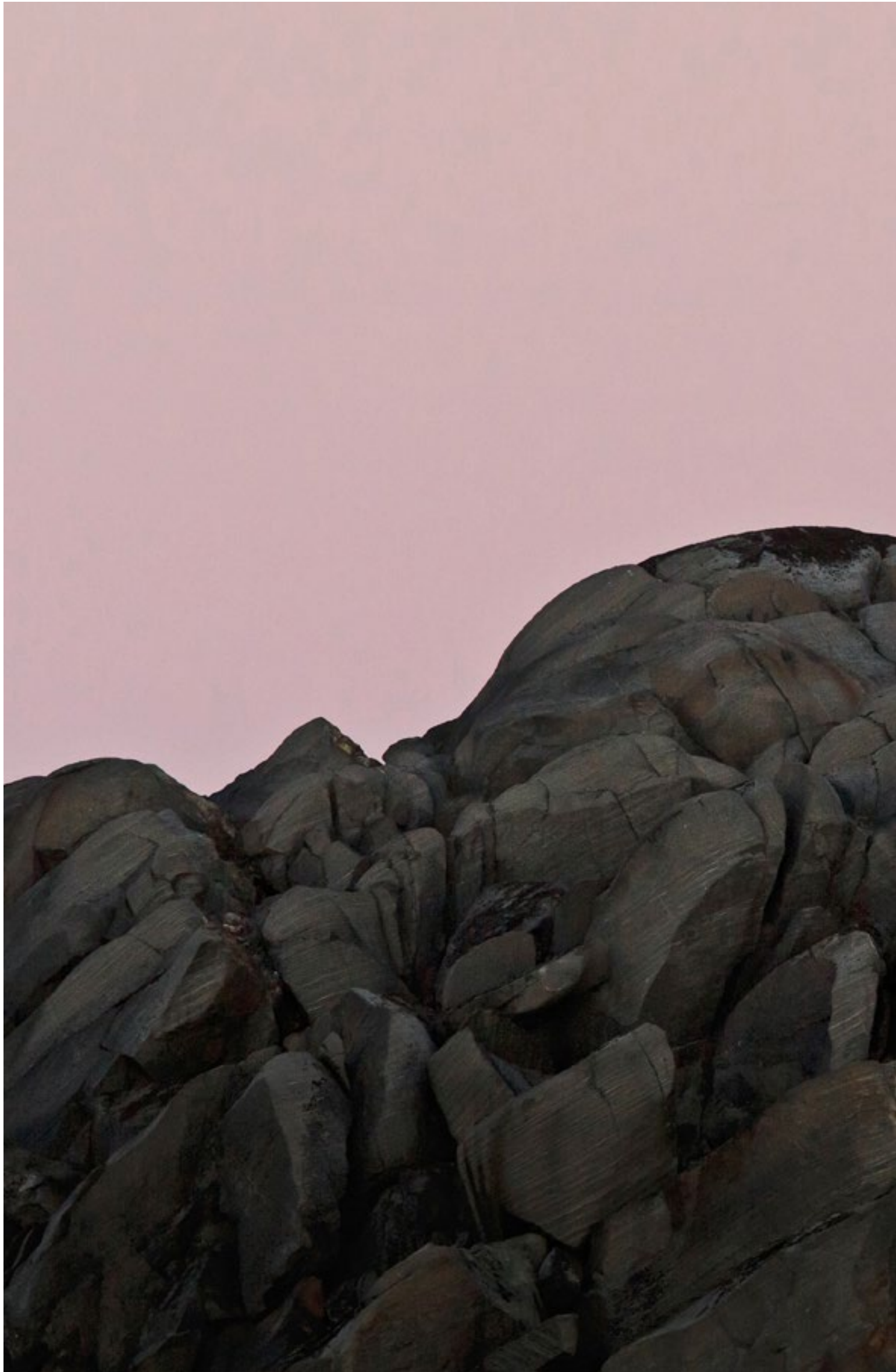












**ON SPREAD** The bear and the moon: A polar bear sleeps on a rock in Carl XII island, Svalbard, Norway, waiting for the return of sea ice in late autumn







**ON SPREAD** Magellanic penguins gathered in a group during a sandstorm in the Falkland Islands: Conditions were difficult, as the sand whipped the photographer as much as the camera





Some still maintain a more traditional lifestyle, living in small villages much the way their ancestors did. However, change has been inexorable. Global warming is causing sea ice to melt and permafrost to thaw, threatening coastal villages with bigger storms and accelerated erosion. As well, the declining sea ice also means that the Arctic Ocean could be opened up for commercial shipping and tourist cruises. The future remains uncertain.





**BELOW** Me and my toy:  
Playful freedom in the Bering  
Sea, Russia





For more on the peoples of the Arctic, go to [www.asiangeo.com](http://www.asiangeo.com) and purchase the award-winning feature, "The First People of the North Pole" (No. 102 Issue 1/2014)



# BECOME ARCTIC PHOTOGRAPHER OF THE YEAR



[www.arcticawards.ru](http://www.arcticawards.ru)

© Photo Sebastian Copeland



# China Jump

ALCOHOL: AN ASIAN CELEBRATION



Bottles of Shui Jing Fang baijiu

## { ASIA }

CHINA

It probably comes as no surprise that the Chinese have finally also claimed the title of being the inventors of alcohol. This is arguably one of the greatest contributions Asia has given to the world – a gift that continues to be the centre of every celebration worth remembering. But it is indeed ironic how this invention stems from deeply religious roots, much like many herb-based trans-hallucinogenic stimulants.

Analysis of 9,000-year-old pottery shards from China's Henan province

revealed the presence of alcohol, some 1,000 years before inhabitants of the Arabian Peninsula, who were previously believed to be the first brewers. At the ruins of a Dawenkou culture site in Shandong province, archaeologists discovered a large number of ceramic wine vessels dating back as much as 5,000 years. As well, recorded history tells of wine-making techniques more than 4,000 years old. Many alcoholic beverages have been used in China since prehistoric times.

Wine jars from the Neolithic settlement at Jiahu, also in Henan province, which date to about 7000 BC, provide the earliest evidence of alcohol in China, which was considered to be a spiritual food that played an important role in religious life. The earliest wines were made from food grains, mainly various kinds of rice, broomcorn and millet.

Maybe it's the excess Neanderthal genes (*see Revealed on page 26*), but Asians seem to have a knack for inventing the good stuff.



The earliest firm evidence of wine production dates back to 5400 BC in Iran. Hindu Ayurvedic texts describe both the beneficial effects of alcoholic beverages and the consequences of intoxication and alcoholic diseases. The medicinal use of alcohol was mentioned in Sumerian and Egyptian texts dating from about 2100 BC. The Hebrew Bible recommends giving alcoholic drinks to those who are dying or depressed, so that they can forget their misery.



A reflection of Asia: Liquor in a glass

## { EUROPE }

Talk about arriving late to the party: The art of wine making only reached the Hellenic peninsula by about 2000 BC. The first alcoholic beverage to obtain widespread popularity in what is now Greece was mead, a fermented beverage made from honey and water. However, by around 1700 BC, wine making was commonplace. During the next thousand years wine drinking assumed the same function so commonly found around the world: It was incorporated into religious rituals.

Alcohol was used for medicinal purposes and established itself as an integral part of daily meals. As a beverage, it was drunk in many ways: warm and chilled, pure and mixed with water, plain and spiced. Alcohol, specifically wine, was so important to the Greeks that consumption was considered a characteristic of the Hellenic culture separating their society from the rest of the world; those who did not drink were thought of as barbarians. ♦ AG



# Who Are We Again?

THE ELUSIVE PAST ADDS MORE MYSTERY TO OUR EXISTENCE

By Alvin Tan



**While** scientists have known for some time that Neanderthals interbred with the ancestors of living Europeans and Asians about 50,000 years ago, new research is trying to explain why Asians – from China, Japan and other East Asian countries – seem to have a 20 percent greater Neanderthal makeup in our genomes compared to Europeans.

It turns out that Neanderthals had a number of distinct genetic mutations that living human beings lack. Based on these differences, scientists estimate that the Neanderthals' ancestors diverged from ours about 600,000 years ago. Our own ancestors remained in Africa until about 60,000 years ago, then expanded across the rest of the Old World. Along the way, they encountered Neanderthals, and our DNA reveals that those encounters led to children.

However, scientists have now discovered that Neanderthals interbred with the ancestors of Asians at a second point in history, giving

**Scientists have now discovered that Neanderthals interbred with the ancestors of Asians at a second point in history, giving them an extra infusion of Neanderthal DNA. And therein lies a paradox...**

them an extra infusion of Neanderthal DNA. And therein lies a paradox...

If Neanderthals became extinct 40,000 years ago, they may have disappeared before Europeans and Asian populations genetically diverged. How could there have been Neanderthals left to interbreed with Asians a second time?

One possibility is that the extinction of the Neanderthals happened later in Asia. If that is true, there might yet be more recent Neanderthal fossils waiting to be discovered here. Another conceivable

scenario is that Asians interbred with some other group of humans that had interbred with Neanderthals and carried much of their DNA; later, that group disappeared.

And so we come to the contemporary discovery of perhaps a fourth member of the human club. *Homo erectus*, found in Java and China; the shorter *Homo floresiensis* from Indonesia; and Neanderthals in the Russian Altai mountains are all still wondering, along with the scientists, who the new guy could be. Penghu 1, a fossilised human jawbone discovered





by a Taiwanese fisherman, sold to an antique shop, and then recovered by researchers could be a new kind of prehistoric man.

The unlikely find could be nearly 200,000 years old. Scientists believe that human jaws and teeth became smaller as they evolved. But unlike other fossils of the time, the newly discovered jawbone is thick, with large molars, suggesting the existence of a different group. Could this new kid on the block be from the second interbreeding scientists are musing about?

To add fantasy to mystery, scientists have also recently chanced upon a 125-million-year-old mule-sized dinosaur with a long tail and short, resplendently feathered wings who roamed a corner of this planet that is now northeastern China.

Named *Zhenyuanlong suni* (or “Zhenyuan’s dragon”, after the museum representative that acquired the specimen), it is the largest-ever winged dinosaur ever found. The relic shows the complete skeleton of the animal, as well as its skull displayed in profile. Clearly visible around the

creature’s short arms are a pattern of long feathers, which also appear to have decorated the dinosaur’s tail.

While it may provide fodder for the next generation of Harry Potter creatures – a dinosaur that looks a lot like a bird – the discovery has left scientists with an intriguing question: Since this is the first time wings have been found on a dinosaur this big with short arms, logically implying that it could not fly, why did dinosaurs evolve wings?

Maybe Penghu 1 has the answer... ♦ AG





# Prominence

## AN ALTERNATIVE MEASURE OF MOUNTAIN HEIGHT

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**To** anyone interested in the geography of the Earth, mountains are a good place to start. Most maps of the planet show the highest points – the mountains that reach highest into the sky. By memorising their altitudes, the geographer can gain a basic knowledge of the continents – Asia and South America soaring into the heavens, and Australia, far below.

But to the mapmaker, geologist and mountaineer, there is another measure of a mountain – prominence. This is the height difference from a specific summit and the nearest low point that separates it from any other summit. In other words, it is measured down from the summit to the nearest saddle, also known as the “key col” (from the French word for “neck”, similar to “collar”).

If you imagined the ocean slowly rising high into the mountains, each





**ABOVE** A panoramic view of Aoraki/Mount Cook National Park, New Zealand

**LEFT** A hiker stands on a mountain peak in Kota Kinabalu National Park, Borneo

## Text YD Bar-Ness

mountain summit would eventually become isolated into its own island when the key col is flooded. At the point when that happens, the height of that new island above sea level is equal to its prominence.

Of course, prominence is a simple linear measure and is not necessarily an exact determinant of the difficulty of a particular mountain climb. But it does give an alternate metric with which to understand the terrain of Earth.

The number of metres of prominence will be much higher for an isolated volcano arising from a flat plain, and much less for a peak that is merely a high point on a plateau. The highest point on a continent or an island will be the most prominent mountain – so Mount Everest (8,848 metres altitude, 8,848 metres prominence) is the most prominent

peak for all of the landmass of Africa and Eurasia.

The key col between two prominent mountains might be very distant – the key col for Mont Blanc (4,808 metres altitude, 4,695 metres prominence) in the European Alps is at 113 metres in Northwestern Russia, where it is divided from Mount Everest. The key col for the North America high point, the Alaskan Denali (Mount McKinley, 6,194 metres altitude, 6,138 metres prominence) is naturally at 65 metres in Nicaragua (not counting the Panama Canal). At this key col, it is separated from the South American high point, Aconcagua, the world's second most prominent peak (6,962 metres altitude, 6,962 metres prominence).

Everest, Aconcagua, Denali and Kilimanjaro (5,895 metres altitude, 5,885 metres prominence) are the world's four most prominent

mountains. Each is the monarch of their own continent. However, because of the low-lying links between the Americas and Africa-Asia, Denali is, mathematically speaking, a bump on a ridge of Aconcagua, and Kilimanjaro is a bump on a ridge of Everest.

Because both Everest and Aconcagua are the high points of the Afro-Eurasian and American landmasses, their prominence is equivalent to their altitude. What about the other island high points?

The summits of islands are also the only peaks on that landmass that have a prominence equal to their altitude. In Antarctica, Vinson Massif rises 4,892 metres in altitude, and is the eighth most prominent peak on Earth.

Each island has its own high point, the most notable being Indonesia's Puncak Taya (4,884 metres), Hawaii's Mauna Kea (4,205 metres), Borneo's Mount Kinabalu (4,095 metres), Japan's Fuji (3,776 metres) and New Zealand's Mount Cook (3,724 metres). Far lower down the list, Australia's Mount Kosciuszko (2,228 metres) is the lowest of the continental high points. As the oceans rise, these island high points will lose both prominence and altitude.

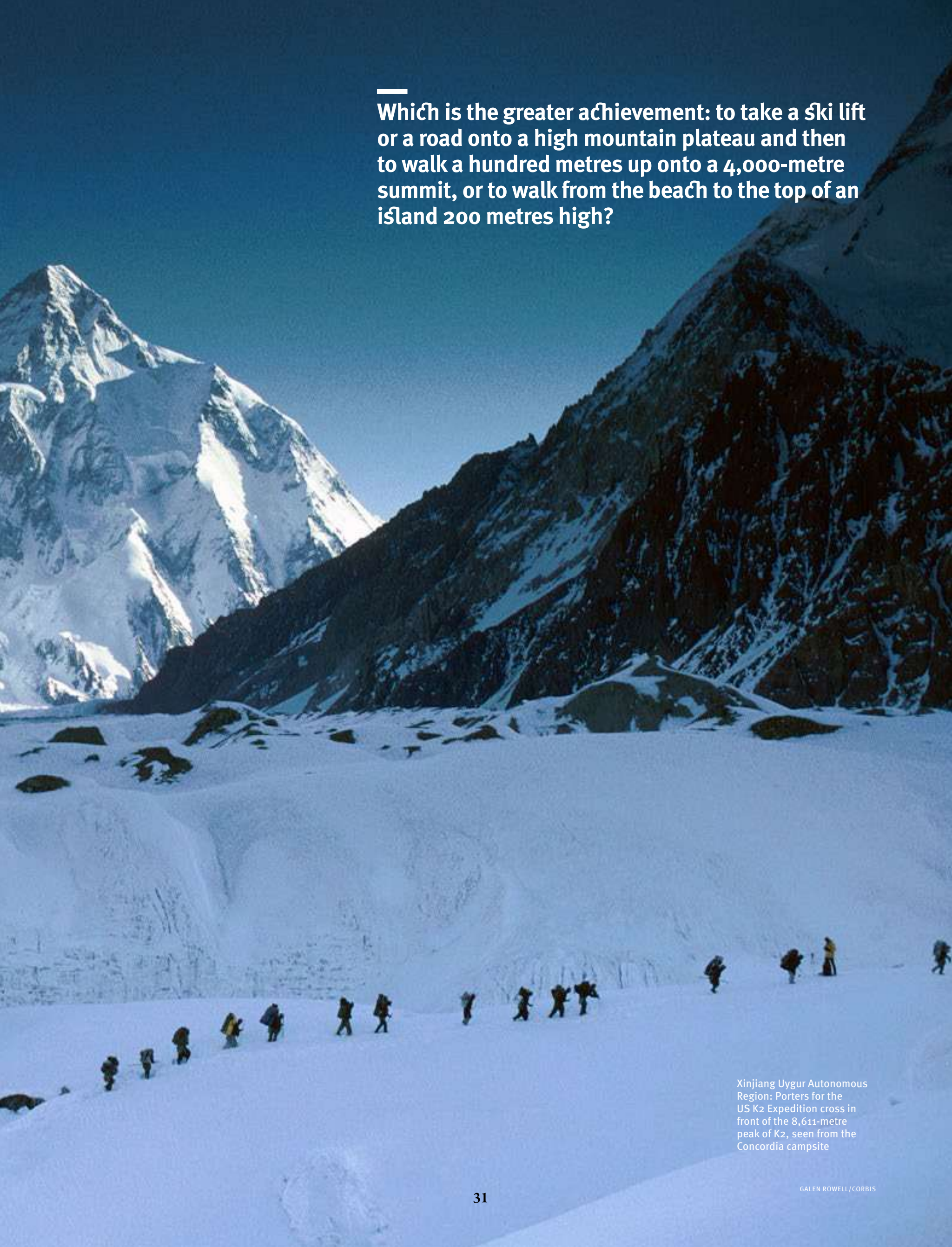






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**Which is the greater achievement: to take a ski lift or a road onto a high mountain plateau and then to walk a hundred metres up onto a 4,000-metre summit, or to walk from the beach to the top of an island 200 metres high?**



Xinjiang Uygur Autonomous Region: Porters for the US K2 Expedition cross in front of the 8,611-metre peak of K2, seen from the Concordia campsite



# The Majestic Rise to World Prominence

**Mount Aconcagua**

6,962 metres altitude

**Mount McKinley**

6,194 metres altitude

**Mount K2**

8,611 metres altitude

**Mount Puncak Jaya**

4,884 metres altitude

**Mount Vinson Massif**

4,892 metres altitude

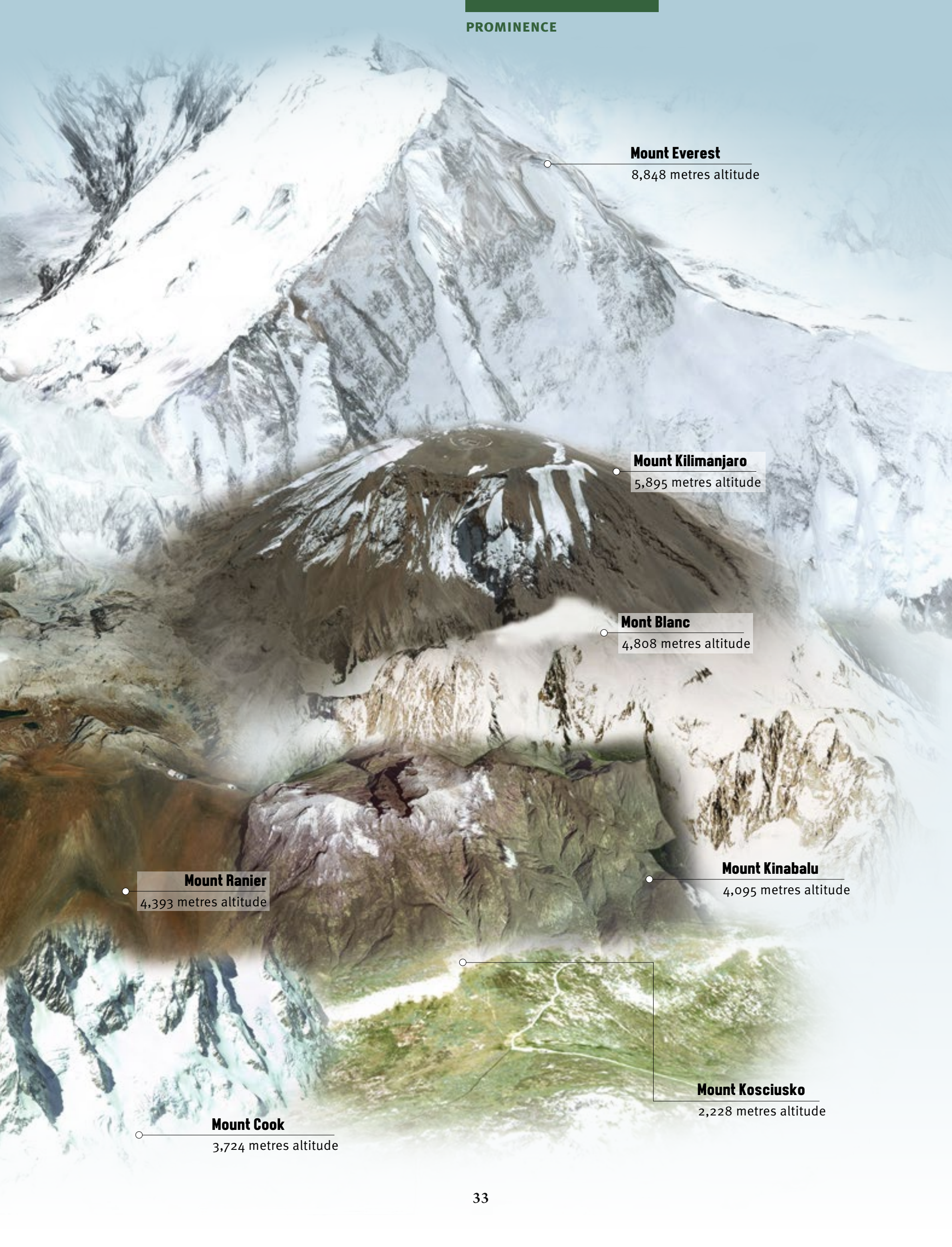
**Mount Mauna Kea**

4,205 metres altitude

**Mount Fuji**

3,776 metres altitude





**Mount Everest**  
8,848 metres altitude

**Mount Kilimanjaro**  
5,895 metres altitude

**Mont Blanc**  
4,808 metres altitude

**Mount Kinabalu**  
4,095 metres altitude

**Mount Ranier**  
4,393 metres altitude

**Mount Cook**  
3,724 metres altitude

**Mount Kosciusko**  
2,228 metres altitude



## The Himalayas

The Himalayas or Himalaya is a mountain range in South Asia which separates the Indo-Gangetic Plain from the Tibetan Plateau. This range is home to nine of the 10 highest peaks on Earth, including the highest, Chomolungma (Mount Everest).

Highest elevation: 8,848 m  
Area: 1,089,133 km<sup>2</sup>  
Highest point: Chomolungma (Mount Everest).

Countries: Afghanistan, India, China, Pakistan, Myanmar (Burma), Nepal, Bhutan

Passes: Rohtang Pass, Khardung La, Nathu La, Gocha La, Araniko Highway, Bara-lacha la, Zoji La, Taglang La, South Col, Chang La, North Col, Lipulekh Pass, Jelep La, Fotu La, Namika La, Marsimil La, Banihal Pass, Sin La, Debsa Pass, Traill's Pass, Dongkha La, Nama

INDIA

HIMALAYAN RANGE

NEPAL

TIBET

CHOMOLUNGMA

SIKKIM

BHUTAN

On the landmasses, the most prominent mountains are not always the tallest. In North America, Mount Rainier (4,393 metres altitude, 4,023 metres prominence, the world's 21st most prominent) is a notable volcano that rises up dramatically from sea level. Amazingly, it is more prominent than the world's second tallest mountain, K2 (8,611 metres altitude, 4,017 metres prominence).

According to the extensive analysis of mountain prominence published by Aaron Maizlish at [www.peaklist.org](http://www.peaklist.org), there are 1,524 “ultra-prominent” peaks on Earth that have a prominence greater than 1,500 metres, half of which are on the Eurasian landmass. China, Canada, and the US – all countries with extensive histories of glaciation – have the most ultra-prominent peaks. The ultra-prominent mountains are most concentrated in the ice-carved Karakoram Range spread over India, China and Pakistan.

A related concept to prominence is vertical relief. Relief is a more generic description of the vertical differences in a region, and can include deep canyons, gorges and craters. For example, the regions of the Grand Canyon in the US and the Blue Mountains in Australia have deep relief from the sharp cutting of

water into the sandstone plateaux to form a gorge.

The study of terrestrial prominence can also make different mathematical assumptions as to whether to include the oceans and glacial ice. If one considers the ocean and oceanic trenches as a key col, then the mathematics changes. Vertical relief under the oceans is measured by depth surveys in the study of bathymetry. There are ultra-prominent mountains such as the stratovolcano Mauna Kea (9,330 metres prominence to the key col underneath the ocean surface) and chasms with phenomenally deep relief such as Challenger Deep (10,911 metres deep). From the bottom of Challenger Deep to the summit of Everest is 19,761 metres – the total vertical relief of planet Earth.

Mountain climbers have long been aware of prominence, and it instinctively measures into the sense

of a climb's difficulty. Which is the greater achievement: to take a ski lift or a road onto a high mountain plateau and then to walk a hundred metres up onto a 4,000-metre summit, or to walk from the beach to the top of an island 200 metres high?

Understanding prominence and relief helps to appreciate the forces and the geology of the landscapes. The mathematics of summits, relief and key cols bring a new dimension to the geography of mountains, hills and canyons – and offers a new vocabulary for charting the Earth's most extreme places. ♦ AG

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**YD BAR-NESS** is a conservation ecologist based in Tasmania in the far southeastern corner of Australasia. As a scientist, he specialises in climbing trees to document the treetop environment and as a conservationist, he seeks to use geography and mapmaking to make every excursion an exploration. [www.outreachecology.com](http://www.outreachecology.com)



Malaysian Green Huntsman  
(*Heteropoda boiei*)  
CH'EN LEE/MINDEN PICTURES/CORBIS

## { THE WILD SIDE OF SABAH }

From Lok Kawi Wildlife Park to the Klias Wetland to the Danum Valley Conservation Area, Kota Kinabalu, Sabah, remains a haven for Nature lovers; all you have to do is slow down and take in Nature's abundant gifts.

Kinabalu Slender Toad  
(*Ansonia hanitschi*)

CH'EN LEE/MINDEN PICTURES/CORBIS

Carnivorous rafflesia flower  
(*Rafflesia keithii*)

FRANS LANTING/CORBIS

Shrub Frog  
(*Philautus* sp)

CH'EN LEE/MINDEN PICTURES/CORBIS

Stag Beetle  
(*Dorcus* sp)

CH'EN LEE/MINDEN PICTURES/CORBIS

Acropora Coral  
(*Acropora valida*)

CORBIS

Balu Bow-fingered Gecko  
(*Cyrtodactylus baluensis*)

CH'EN LEE/MINDEN PICTURES/CORBIS



Deserts can be stark and beautiful, but they aren't easy places for humans to live and grow food. While the Earth's major deserts are naturally occurring, there are several regions in which harsh desert-like conditions are developing from once-greener places. An entirely different thing from the natural wild ecosystems of the dry deserts, these new deserts are degraded ecosystems.



### WHAT'S HAPPENING?

Landscapes are losing soil and vegetation, becoming drier and supporting less forest or agriculture. One component of desertification is the exhaustion of farming lands. Understanding and classifying desertification is difficult as it is both a sociological and ecological puzzle and it has impacts on many scales, from the single plant to the continental landscape.

### WHAT CAUSES IT?

In the geological past, deserts shrank and grew, but now, desertification is exacerbated by global climate change and human pressures. Deforestation, poor farming practices, overgrazing and poor management of water resources are all part of the problem. In extreme instances, once-vegetated areas have become bare sandy ground.

### WHERE IS IT HAPPENING?

About half of the world's farmland is affected by desertification, on every continent except Antarctica. The world's natural desert regions are most prominent at 30 degrees north and south of the equator, and on the edges of these zones, desertification is at its most intense.

According to the United Nations Convention to Combat Desertification, 168 countries are currently impacted by desertification, and each year, an area of farmland approaching the size of Greece (~120,000 square kilometres) is degraded.



## PROMINENCE

**LEFT** Ningxia Hui Autonomous Region, China: Lush village fields beside the Yellow River contrast with the Tengger Desert

**BELOW** The Kumtag Desert near the southwest edge of Lop Nur



### HAS IT HAPPENED BEFORE?

The Upper Yellow River areas of China, the Fertile Crescent (the land in and around the Tigris and Euphrates rivers) and the Dust Bowl of Oklahoma (USA) are all well-known examples of human-exacerbated desertification. Once forested, these areas were converted into fertile agricultural regions, eventually becoming desertified as the topsoil was exhausted, blown off or washed away. Their present-day agricultural capacity has been greatly reduced as a result.

### WHY SHOULD WE CARE?

When agriculture and water supply are severely impacted by desertification, the people and cultures that depend on them are also severely impacted. Many of the migrations, famines, and wars in history have been linked to the stresses of desertification.

### CAN WE STOP IT?

Retaining vegetation and using water carefully is essential to slowing desertification. Blocking the winds and diverting floods will protect the remaining soil. Lessening intensive agricultural practices and reducing the density of grazing animals will slow the advance of desertification.

### CAN WE REVERSE IT?

Replanting trees to block the wind, reshaping the land to collect water and adding fertiliser to replace lost soil can all help to revitalise degraded lands. However, in each region there are unique human and environmental challenges, so various methods will need to be developed and tested.

Over time, reforestation and sustainable agricultural practices will allow the soil to reaccumulate. As more vegetation grows, soil moisture and fertility will slowly return. This process may take many years or even centuries, but the efforts now will pay off for future generations.



# The Philippine Archipelago

PEAKS OF ADVENTURE

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Text Liron Shimoni

**The** Philippine Archipelago offers its visitors numerous extreme sports in the air, sea and on land: hang-gliding and skydiving, scuba diving and sail boating, sandboarding and dirt bike rides. But the most popular activity in the country is hiking on various levels, promising spectacular scenery and exciting meetings with the local culture.

The Philippine tarsier is a primate endemic to the Philippines and is found in the southeastern part of the archipelago. It measures 85 to 160 mm and is active only at night





I arrived at northern Luzon following a night ride from the capital, Manila. Of the 7,107 islands in the Philippines, this is the largest and most populated, yet even here there are enormous tracts of sparsely populated land that constitute a true paradise for trekkers. The bus stopped at the central station in Banaue in the early morning hours. I equipped

myself with some food and water and set out on a 10-hour hike into the Cordilleras Mountains.

At the outset, the trail was traversable eolianite rock. As I delved deeper into the landscape, the sounds of the city abated behind me, and the trail narrowed – I was soon enveloped in the wild beauty of Nature. At times the trail climbed steeply up the

mountain and sometimes, it descended and meandered into the ravine. The rain that had fallen over the previous days left the ground slippery and my decision to wear high, waterproof hiking shoes was vindicated.

For me, the trail was a great excuse to use my new Swiss army knife that I had bought before the trip. I whittled the tip of a dry branch and fashioned



### Excessive Incursion

The Philippines sit astride the typhoon belt and it suffers an annual onslaught of dangerous storms from July through October. These are especially hazardous for northern and eastern Luzon and the Bicol and Eastern Visayas regions, but Manila gets devastated periodically as well.



**The sight of the women working together reminded me what cooperation, kindness and mutual respect are, values that at times seem to have been displaced in Western culture.**

it into a staff. Before long, I became addicted to the quietude of Nature, broken only by the birdcalls and the gurgling streams. In the afternoon hours, I keenly felt the physical and mental exhaustion. The heavy backpack made walking difficult and the trail began climbing, as if to test my last reserves of stamina. Finally, when I reached a high point where the sky touched the rice terraces characteristic of this area, I came face to face with Dimangan, the local harvest deity worshipped by the Ifugao

tribe. My being was flooded with a profound sense of satisfaction.

Many archaeological findings indicate that the Ifugao had been carving out terraces in the steep mountainsides for more than 2,000 years. Using unique techniques, passed down through the generations, they carefully carve the face of the mountain and create agricultural plots in harmony with the natural environment.

In the days following my arrival at the village, I walked among the humble huts and spoke to the residents, learning about their lives. I was glad to see that, along with evident signs of modernity, the people still clung to their traditions. As I was making my way gingerly down the rock paths, I met a group of women who were preparing to return home at the close of a gruelling day's work. When they noticed me, they stopped what they were doing and smiled at me graciously. The sight of the women working together reminded me what cooperation, kindness and mutual respect are, values that at times seem to have been displaced in Western culture.

My next destination in the Philippines was the island of Bohol. After a short internal flight, I landed in Tagbilaran airport, the portal to the island. Upon arrival, I was met by Randall, an experienced motorcyclist



**LEFT** A villager rides her horse near the active Taal volcano, located in the heart of a large lake south of Manila

**TOP RIGHT** The Cordilleras of northern Luzon: Of the Philippines' 7,107 islands, Luzon is the largest and most densely populated, but you can still find vast areas that are sparsely populated

**BOTTOM RIGHT** The figure of Dimangan, goddess of the crops, worshipped by the Ifugao ethnic group





whom I had prearranged to accompany me during my sojourn on the island. As the motorcycle galloped down the asphalt road, the scenery shifted rapidly: one moment we were surrounded by green rice paddies and the next, we found ourselves in a dense forest. Before long, the skies darkened, a gale picked up and large raindrops splattered the road. Randall decided not to continue and stopped the motorcycle at the entrance to a farm; a sign overhead read, “The Philippines Tarsier Foundation”.

Before my trip I had read about this tiny endangered mammal, which was hardly seen in the wild anymore. The foundation has established a large, densely tangled enclosure, which simulated the tarsier’s natural habitat, allowing visitors to see it. During most of the daylight hours, the tarsier is drowsy, but during its nocturnal activity hunting insects, lizards, bats and snakes, its eyes

widen to a diameter of 16 millimetres and it becomes a keen and extremely agile hunter.

Once the rain stopped, we resumed our ride and before long, reached the famed Chocolate Hills, a natural

phenomenon unique to the area. A strenuous climb up a steep stairway led us to a vantage point from which one of the most dramatic and surreal vistas I had ever seen unfolded before me – sprawling verdant hills lit by







## Another extreme sport available in the Philippines is scaling one of the country's 37 volcanoes, 18 of which are still active.

**ABOVE** Local Ifugao women work at the rice terraces in Batad village, central Luzon, using unique techniques passed down orally from generation to generation

**RIGHT** The ancient Ifugao people carved terraces on the steep slopes of the mountains at altitudes of between 700 metres and 1,500 metres above sea level

individual rays of sun that penetrated the cloud cover.

Geologists investigating the phenomenon surmise that the combination of chalk stratum sitting atop dense clay interacted with the rainwater to form in the relatively limited area of 50 square kilometres crammed with an astounding 1,776 peaks, ranging in height from 50 to 120 metres. At the end of the dry season, the green hills turn brown, hence the name “Chocolate Hills”.

Another extreme sport available in the Philippines is scaling one of the country's 37 volcanoes, 18 of which are still active. After returning to Manila, I set out on a trek in the volcanically active region of Taal,

which is situated at the heart of a large lake south of the capital and contains 47 locations of volcanic activity. When I arrived at the town of Talisay, I rented a driver and a motorboat, and I was soon speeding towards the volcano, the warm waters of the lake spraying in all directions.

The local residents maintain a love-hate relationship with the mountain, but generally treat it with a healthy measure of respect. Since the Spanish started tracking its activity in 1565, there have been 33 eruptions on record, the most significant one being in 1911 wherein 1,134 died. Due to the present increased volcanic activity, the Philippine Institute for Volcanology and Seismology (PHIVOLCS)





recommended that the government not allow permanent residence in the area because of the constant threat and declared the entire island an imminent danger zone.

Upon arrival at the foot of the mountain, I began climbing up the steep path. For me, it was the first experience of climbing up a volcano and I didn't really know what to expect; maybe this is why my breath was taken away when I saw the maw of the volcano. In the centre of the verdant crater there was a pool of turquoise water and occasionally a soft hiss could be heard followed immediately by an eruption of steam. In 1991, renewed volcanic activity was registered with the emergence

of cracks in the rock and formation of boiling mud pits and geysers. This led to the assumption that the mountain would erupt again soon and the entire island was declared by the international association for volcanology one of the 16 most dangerous volcanoes of the decade.

Nearby, a group of Spanish mountain climbers sat engaged in lively conversation. As I approached, they invited me to join them. "With water boiling at 120 degrees one can cook a complete meal in a few minutes," declared one of them and in so saying offered me hard-boiled eggs, which he drew from a smoking aperture in the rock while imitating the hissing sound of the volcano.

As the sun began to set, I hurried back to the boat, and on our return journey, I glanced back at the diminishing mountain, wondering when its simmering anger would once again boil over... ♦ AG

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**LIRÓN SHIMONI** is an Israeli photographer and a visual anthropologist based in Barcelona, Spain. His photos and articles have been published in magazines and books around the world.



# Once a Fishing Village

EMBRACING THE IMPORTANCE OF  
MARINE CONSERVATION AND ECO-TOURISM

By Glenn Yong

Located within the northwestern islands off the Philippine province of Northern Samar, the Biri Islands are home to a small fishing village plagued by a history of illegal ornamental fish trade, massive shark finning operations, and the occasional dynamite and cyanide fishing by the local fishermen.

However, through the years, increased efforts of the villagers and the government have seen this small, sleepy fishing village slowly transform itself into a destination for conservationists, budding marine biologists, weekend tourists and explorers from foreign lands.

Taking a short one-hour domestic flight from Manila International airport and an hour's drive to the Northern Samar Port, one can board a small *bangka*, a fishing vessel that provides the principal sea transport here, from Northern Samar to Biri. You pass some interesting sights on your way there, from huge Christian monuments to large mangrove forests surrounded by crystal-clear deep blue waters.

It is obvious that the village understands the importance of conservation. Printed

posters throughout the village discourage the use of cyanide and dynamite fishing while the planting of new mangroves in the area aims to prevent soil erosion during the annual monsoon season – and the frequent onslaughts of typhoons.

Homes have slowly improved and secured with concrete through the support and aid of local NGOs, and they now have access to electricity and fresh water from wells, not to mention various “extras” such as soft drinks and cable television.

**The Biri Islands are home to a small fishing village plagued by a history of illegal ornamental fish trade, massive shark finning operations.**



**LEFT** Waters are clear and cool, but often visited by illegal ornamental fish traders. The end result? Very little fish left in the area

**ABOVE** Locals bringing in construction materials from the mainland via local boats in the hopes of rebuilding their homes, while children, oblivious to the issues, are often seen having fun near the jetty

**RIGHT** Biri Island's stunning rock formation on the western coastline







## Breathtaking Sights Forged Through Time

The Biri Islands are traditionally famous for their natural rock formations, and the locals from Manila and throughout the country visit the island to marvel at these majestic structures. That feeling you have while in the presence of such formidable formations is just not something words can easily describe – the beauty and power of the waves crashing on the rocks, the strong surface winds, and ocean breeze surging across the entire landscape. For once, time stands still, as you are mesmerised for hours by this amazing sight.

The islands lie at the perimeter of the Pacific Ocean, and this comes at a cost of being in the frontline of powerful typhoons, yet juxtaposed against the beauty of crystal-clear waters and incomparable reefs. Underexplored even by local divers, most of





### Language Barrier

Most of the locals in Catarman, the capital of Northern Samar, cannot speak English, while some on the Biri Islands converse mainly in Tagalog. It is recommended that divers make prior arrangements with the resorts on Biri for a pickup from Catarman National Airport by an English-speaking crew.

**ABOVE** A local convenience store where you can get anything from slippers to pirated DVDs to coconuts!

the dive sites here are unnamed or untagged. Knowledge comes from the experience of dive guides who were once fishermen themselves.

The reefs are thriving, with large reefs and coral outcrops, and occasional visits by large wild tuna, sharks and mantas during the May-to-June season. The waters around the Biri Islands have been declared a marine sanctuary by the local government years ago to encourage eco-tourism and sustainable fishing within the community.

These islands do not see more than an estimated 100 tourists a year, and although their facilities fall short of those on Boracay or Cebu, they boast a few local resorts that can cater for urban escapists and beach seekers, complete with air-conditioning and fresh water pumped up to the rooms. This is truly a destination where you can experience island life like a local: No inflated prices for food and snacks or even the local motorbike rides to various parts of the village.

The power comes on at noon and ends at midnight, with everything else running on either batteries or generators. Guests who require electricity after 12am have to pay for fuel to power the generators – a reminder of what city folks take for granted and the environmental consequences of our conveniences. It is fascinating to see how local people work around the 12 hours of electricity they have.

Biri offers not just scenic sights on land and underwater, but also a life-changing experience, where you enjoy the simple pleasures of fresh water, fresh air, and crystal-clear waters. The friendly locals are curious about where you are from, and despite their limited command of the English language, they will try hard to understand you, and teach you a little about local customs and traditions.

With fish stocks having declined precipitously over the last few years due to overfishing and non-sustainable fishing practices, the people here appreciate how much tourism is helping them to improve their lives. ♦ AG

**GLENN YONG** is a commercial photographer by trade and has taken a special interest in exploring visuals underwater. He frequently travels around Indonesia and the Philippines. In 2013, he was accredited by the Master Photographers Association in the UK. Glenn runs a photography company based in Singapore and has plans to further explore the waters around Asia.



# Going Solar

PHILIPPINES' RENEWABLE EMBRACE OF THE SUN

By Jim Neale

While the Philippines is one of the most energy dependent nations in Asia, it is now finding solutions and embracing some of the most advanced solar technology available. This new strategy is already having a positive impact on the inefficient and strained power system, which supplies electricity to the scattered islands of the archipelago.

Due to a lack of natural resources, 70 percent of the country's electric power is generated from imported fossil fuels. Since foreign fuel has to be shipped to the Philippines, the country holds one of the highest per kilowatt hours in the world, ranking even higher than the costly energy rates of its regional neighbours like Singapore, Hong Kong and Japan.

The Manila-based Asian Development Bank (ADB) has launched its Asia Solar Energy Initiative, which aims to raise US\$2.25 billion to fund both private and public sector power generation projects throughout Asia and the Pacific. It is hoped that this transition to clean energy will help slow and perhaps even alter the course of global warming.

A more direct example of ADB's commitment to combat the effects of climate change can be found on the roof of its own headquarters. It has recently installed a 680-kilowatt peak (kWp) solar power system, to help generate over three percent of the bank's daily electricity requirements.

In the aftermath of deadly Typhoon Haiyan in November 2013, many non-governmental organisations have recently contributed clean renewable energy alternatives to isolated communities of the Philippines. Most people live with limited, intermittent electrical supply and in some towns, none at all. Thousands of donated solar lanterns have improved the health conditions and quality of life for the families in these remote villages by reducing their exposure to kerosene lanterns. Solar technology is helping to replace the expensive and hazardous dependence on kerosene, and allowing children, for the first time, to read more easily at home and improve the quality of their education.

On the Philippine island of Negros Oriental, overseas investors are taking

advantage of the government's new Feed-in-Tariff policy, which offers tax incentives for renewable energy enterprises. These encouraging governmental approaches have helped to secure private sector investment in clean energy, as well as giving an added boost to the local economy. Job development and skills are created on site to construct, maintain and modernise these renewable power plants. The uninterrupted flow of efficient electricity means factories, schools and offices can operate at full capacity and economic growth will be sustainable and clean.

In recent years, advances in technology have also made solar power more cost effective and economically realistic to utilise. Lower cost per kilowatt-hour means solar has become more affordable, viable and beneficial to a warming world. Green and non-depleting technology can be a successful strategy to counter the realities of climatic change, and its gradual acceptance in the Philippines has allowed its people to heal and even prosper, while embracing the renewable power of the sun. ♦ AG



# Black Water

CAMBODIA'S FIRST UXO DIVE TEAM STARTS TO MAKE RIVERS SAFE

The UXO salvage dive team handle an unexploded 1,000-pound bomb found in a river in Kratie Province, Cambodia.



**Text** Robert Carmichael  
**Photos** Charles Fox

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**Kandal** Province. Sok Chenda had a lot going for him when he volunteered for a tough, two-year course, training to remove bombs and unexploded ordnance (UXO) from Cambodia's rivers.

For a start, the 38-year-old had spent nearly two decades at the Cambodian Mine Action Centre (CMAC), the government's demining organisation, first as a deminer, then as a researcher, and finally, as a technical instructor and UXO team leader. Partly by nature and partly by training, Chenda is cautious and patient, a "safety-first" person.

But for someone looking to transfer those skills underwater, Chenda was missing one key element: he couldn't swim much at all.

He wasn't alone. None of the 40 men (no women applied) who signed up in 2013 for the gruelling course run by ex-US Navy divers knew how to swim.

That was just one of their many learning curves. Another was how to operate in a zero-visibility environment, known by divers as "black water". That is because the Mekong River, which carves a roughly north-to-south path through eastern Cambodia on its route to the South China Sea, carries so much silt that a

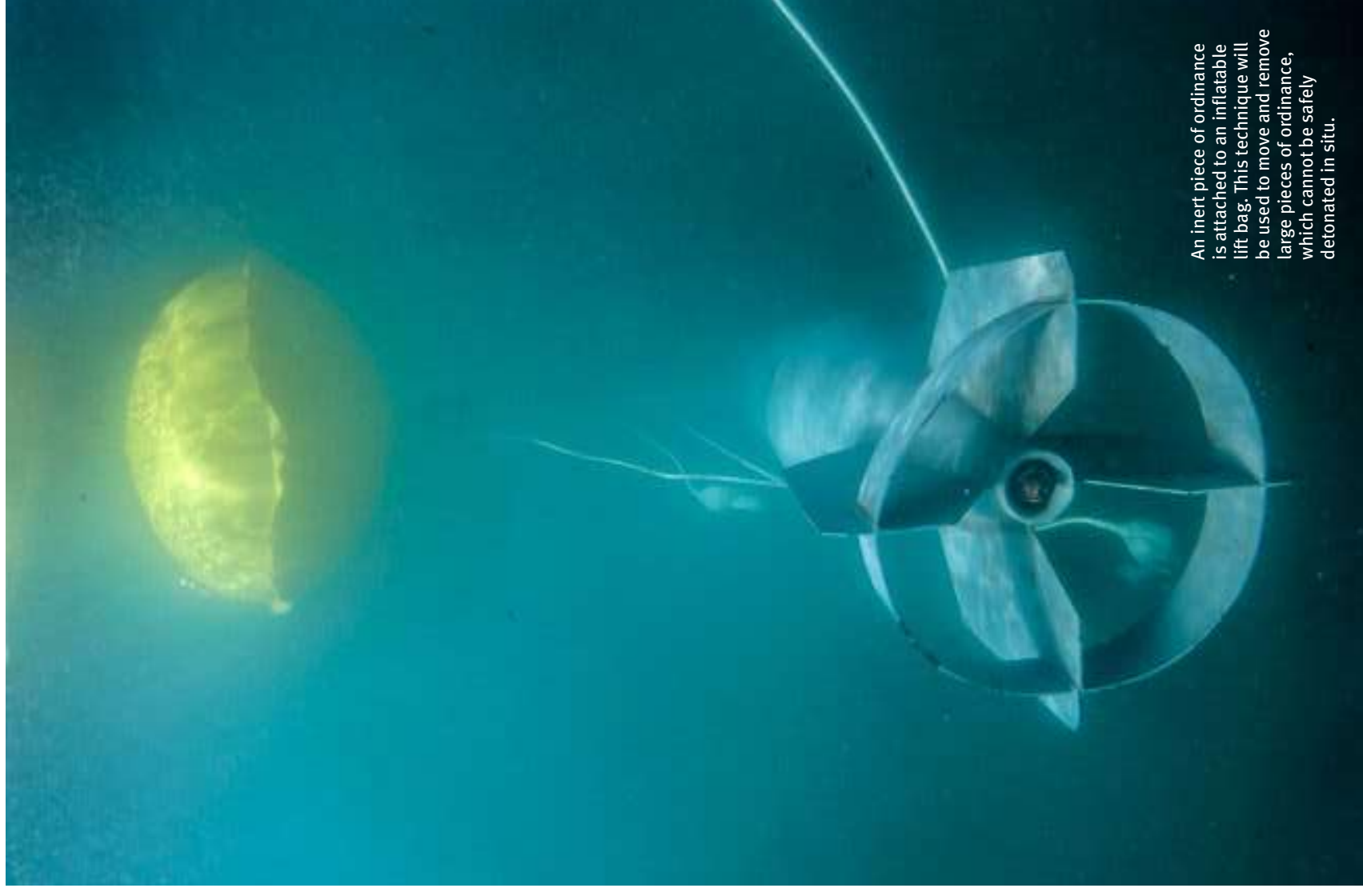
**It gets more complicated still, because removing UXO from underwater is far more dangerous than its land-based equivalent**

diver can't see their hand in front of their face.

"So at first, we wore blacked-out masks and learned how to identify the different explosives on land," says Chenda, a stocky man with an easy smile. "After that, we went underwater and used those same tactics that we'd learned on land."

It gets more complicated still, because removing UXO from underwater is far more dangerous than its land-based equivalent, and it's trickier still to raise UXO from rivers as opposed to the sea. Strong currents, the lack of visibility, river debris and boat traffic all conspire to heighten the risks. Given the rigours of the role, the trainees had to pass a series of tough physical and mental tests.

In the end, just nine made the grade. Chenda was one of them. In May, with Chenda as team leader,



An inert piece of ordnance is attached to an inflatable lift bag. This technique will be used to move and remove large pieces of ordnance, which cannot be safely detonated in situ.



they carried out their first mission: recovering and making safe a 500-pound (227-kilogram) US-made Mark-82 bomb from the Mekong near the capital Phnom Penh.

Why volunteer for such dangerous work? Simple, Chenda replies, “It is very important for the sake of developing our country.”

## History’s Long, Deadly Reach

The Mark-82 bomb is part of Cambodia’s legacy of decades of conflict, from the US’s illegal bombing in the late 1960s and early 1970s, to the civil war that culminated in the 1975 victory of Pol Pot’s Khmer Rouge movement, whose four-year rule cost two million lives. After the Khmer Rouge were ousted in 1979, fighting continued for another 20 years.

Since 1979, landmines and UXO have killed nearly 20,000 people and

injured more than 44,000. But the situation has improved markedly. As demining groups like Cambodian Mine Action Centre (CMAC), Mines Advisory Group (MAG), and The Halo Trust press on, clearing around 100 square kilometres of land each year, the annual toll has decreased. Last year, landmines and UXO killed 21 people and injured 136.

To date, this work has been done on land where, for example, CMAC has

recovered 4,000 bombs. The advent of the dive team means it can now take this search underwater.

Under normal circumstances, a country would train a military dive unit to recover underwater UXO. This is the first time that a dive team tasked with humanitarian work like this has been trained from scratch.

The training, funded by the US State Department, was carried out by the Golden West Humanitarian

**ABOVE** A fisherman and his wife pull out an unexploded mortar round from the Mekong near Phnom Penh. Fishermen often dive into the rivers using compressed air created by a diesel generator to un-snag their nets when they get caught on the bottom of the river

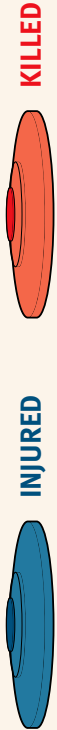
**LEFT** 33-year-old UXO salvage diver Leng Channak takes part in the training programme devised by the USA 7th Engineer Dive Detachment off the coast of Sihanoukville. The divers train to identify UXO (inert for training purposes) wearing “black-out” masks to simulate the zero visibility they will encounter in the rivers and lakes of Cambodia



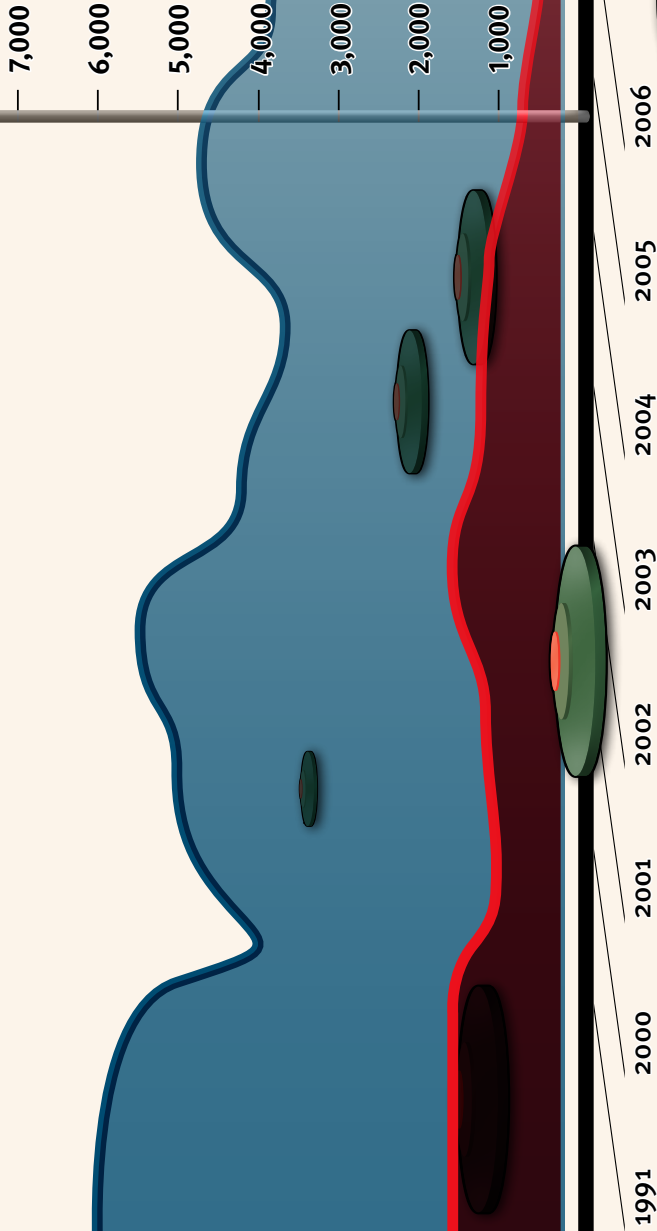


# Casualties since 1999

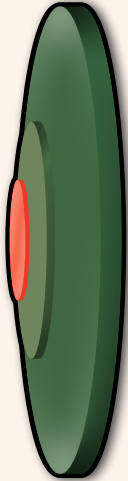
Mine/ERW (explosive remnants of war)  
Casualties by Killed/Injured (31 States Parties)



The data collected by the Monitor is the most comprehensive and widely used annual dataset of casualties caused by mines, victim-activated improvised explosive devices (IEDs), cluster munition remnants, and other explosive remnants of war (ERW). Data has been collected annually since 2000 (for 1999 data) from a range of sources including national mine action centres, UN agencies, the ICRC, humanitarian clearance operators, medical and rehabilitation centres, and media sources.



Source: [www.the-monitor.org](http://www.the-monitor.org)



The 31 Mine Ban Treaty States Parties  
with significant numbers of survivors are:

1.	AFGHANISTAN	6.	BURUNDI	11.	CROATIA	17.	JORDAN	23.	SERBIA	29.	UGANDA
2.	ALBANIA	7.	CAMBODIA	12.	EL SALVADOR	18.	MOZAMBIQUE	24.	SOMALIA	30.	YEMEN
3.	ALGERIA	8.	CHAD	13.	ERITREA	19.	NICARAGUA	25.	SUDAN	31.	ZIMBABWE
4.	ANGOLA	9.	COLOMBIA	14.	ETHIOPIA	20.	PERU	26.	TAJIKISTAN		
5.	BOSNIA AND HERZEGOVINA (BIH)	10.	DEMOCRATIC REPUBLIC OF CONGO (DRC)	15.	GUINEA-BISSAU	21.	SOUTH SUDAN	27.	THAILAND		
				16.	IRAQ	22.	SENEGAL	28.	TURKEY		

This includes all of the original 24 States Parties with significant numbers of victims in need of assistance that self-identified during the period around the First Review Conference of the Mine Ban Treaty in 2004 and others that subsequently declared this responsibility; as well as Algeria and Turkey, which both noted similarly high numbers of casualties in reporting to the Mine Ban Treaty.





**First, diver Lorn Sarath dug away the mud surrounding the bomb's nose. Then Chenda descended and attached the cables from an inflatable balloon to the bomb, which was still live**

Foundation, a US-based non-profit, which for more than a decade has helped demining and UXO efforts here. Watching the first mission from a nearby boat, country representative Allen Dodgson Tan tells *ASIAN Geographic* the team's purpose is to focus on UXO that pose a risk.

"We're not trying to clear the river of all the ordinance and explosives in there – it's not possible," says Tan, a former US Army bomb disposal expert. "There are probably hundreds

of thousands of pieces of ordinance in Cambodian waterways, and they're fine right where they are buried under lots of mud."

Each time a bomb is called in, the team will assess the situation: "Is a fisherman getting his net caught in it? Is a boat going to hit it? Are they going to build something like a bridge where they need to clear an area for a pylon? Are they going to dredge there?" he explains. "These are the kinds of things we look at."

## Swords into Ploughshares

And so, as the sun pushed higher and the palm trees' shadows on the banks shortened, the team got to work. The recovery took less than an hour. First, diver Lorn Sarath dug away the mud surrounding the bomb's nose. Then Chenda descended and attached the cables from an inflatable balloon to the bomb, which was still live.

Inflating the balloon jolted the bomb free, the most dangerous part of the operation. After that, the team







**TOP LEFT** Ten year-old Te Denar at home holds a photograph of himself: He sustained injuries when the fuse of a mortar round ignited while he was holding it. Denar found the fuse in Kampong Thom Province, while out playing with his cousins. His brother took the photograph to show to NGOs in the hope that one of them could help in any way, but did not know how to go about asking

**TOP RIGHT** UXO at the "Elephant Range" in Kampong Chhnang Province

**ABOVE** Journalists report on the MK82 bomb, which the dive team raised from the bottom of the Mekong River

towed it to the ferry crossing, then drove it – slowly – across rutted tracks to a nearby field. There, the Mark-82's nose and tail were cut off, removing the two fuses and making it safe.

The bomb was then taken to a Golden West facility, where its 250 pounds (113 kilograms) of explosives was turned into 1,000 small charges. Deminers use those charges to blow up the landmines they uncover – a virtuous circle, says Golden West's Tan, turning "weapons of war into tools of peace".

What's next? The team has located an ammunition barge sunk during the civil war and which CMAC reckons still contains its explosive cargo.

Over the years, says Tan, sunken ammunition barges were scavenged by illegal operators who sell the explosives on the black market – both a security risk and a public safety hazard.

"Previously, if this boat were to be discovered by the police, there would be no recourse... They had no one they could send down to deal with that," he says. "Now, with our team, they do." ♦ AG

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South African journalist **ROBERT CARMICHAEL** has worked in Cambodia for eight years and is the author of *When Clouds Fell from the Sky*, a new book about the causes and consequences of the Khmer Rouge's brutal 1975–79 rule of Cambodia. [www.whencLOUDsfell.com](http://www.whencLOUDsfell.com)

**CHARLES FOX** is a British photographer based in Cambodia. His work focuses on the legacy of conflict and colonialism and how the rulings of the past affect the present. [www.charles-fox.com](http://www.charles-fox.com)



Text YD. Bar-Ness

NORTH  
ATLANTIC  
OCEAN

The surface of Earth is mostly ocean and in the middle of these vast waters are lonely and isolated bits of dry land. Remoteness can be measured by distance to continental land, other islands, other humans, or by ease of access. Determining which islands are the most remote is an excellent exercise in map reading and geography. Here, we look at a selection of candidates for the most isolated spots of land.

SOUTH  
AMERICA

SOUTH  
ATLANTIC  
OCEAN



**Pitcairn**  
**25°04'S 130°06'W**  
**THE PACIFIC OCEAN'S MOST REMOTE ISLAND GROUP**  
First settled temporarily by Polynesian mariners, Pitcairn was famously inhabited by Tahitian and English mutineers from the British ship *Bounty*. Their descendants live there to this day, more than 2,000 kilometres from Tahiti and 5,000 kilometres from New Zealand.

**Bouvet Island**  
**54°25.8'S 3°22.8'E**  
**THE MOST REMOTE ISLAND**  
Bouvet Island is a small, uninhabited volcanic island in the far South Atlantic claimed by Norway during the early days of Antarctic exploration. The crater rim of the island is 780 metres tall, and almost the entire land mass is covered by ice. From the cold shores of Bouvet Island, it is 1,700 kilometres to the Queen Maud coast of Antarctica.







**Tristan de Cunha**  
**37°4's 12°19'W**  
**THE MOST REMOTE INHABITED ISLAND**

The volcanic island of Tristan de Cunha in the South Atlantic is the most remote island on Earth. First settled by humans in 1810, it is now part of the British Commonwealth. The 300 inhabitants live more than 2,400 kilometres from the coast of South Africa.

NORTH  
PACIFIC  
OCEAN



INDIAN OCEAN

AUSTRALIA

**The Kerguelen Islands**

**49°15's 69°10'E**

**THE MOST REMOTE ISLANDS IN THE INDIAN OCEAN**

Claimed by France, these islands were visited by passing whaling crews. It is now maintained as a research base and has been involved in historical geomagnetic studies. Vegetated only by a single species of cabbage, lichens and moss, it is now also home to grazing sheep and released trout. The Kerguelen Islands are 3,700 kilometres from South Africa and 4,200 kilometres from Western Australia.



SOUTHERN  
OCEAN









# Megasapiens

◆◆◆ *Towards the Extreme City*

◆◆◆ TEXT  
YD Bar-Ness

The tallest building, the most expensive hotel, the biggest buyer of Airbus A380s – there's only one attribute to describe Dubai: MEGA!



**Humans** are social creatures and we enjoy the company of others. In the earliest times, a handful of family groups would gather temporarily to eat together, teach one another, and have sex. Every face was a familiar face. With agriculture, these gatherings could become permanent and people would gather together in greater numbers. Soon, the group was large enough that faces became unfamiliar. Structures were built, rules were developed, and eventually villages were established.

The villages have become towns, the towns have become cities, and now, we have something new. We have gathered into groups that are orders of magnitude greater than the earliest cities, and we spend most of our lives surrounded by strangers.

Many other animals have home territories, and a subset of these puts effort into building and improving these environments. Wasps, bees, ants and termites create intricate constructions of earth and paper. Beavers fell massive trees and create dams across rivers. Rodents and birds collect material to build nests. Many other animals dig into the earth to create a safe and secure burrow. But their achievements pale in

comparison to the cities of our own species. The largest cities of today are the largest and most complex things ever constructed. They live, they die, they grow – and they will outlast you and me.

### Cities as Survivors

A simple and familiar analogy compares a city to a living organism. This organism survives by transporting the vital elements of life – food and water – from regional landscapes in towards the dense urban environment. Settlements that have survived to the present day can be thought of as anatomical bodies, with various functions such as sewage, transport and economy. They can be assessed as healthy or sick. Those that are failing to meet these functional challenges will decline.

This analogy also assists – to a limited extent – in understanding how to maintain living cities. If a city is thirsty, you must give it water. The massive cities that now exist on Earth can be looked at positively – as entities that have successfully met these challenges over long periods of time. They can also be looked at cautiously: Will the resources they require be available





♦ ♦ ♦  
**To describe populations, a new unit can easily be developed – the sapien. One sapien is one human, *Homo sapiens***

into the future? This helps us to be proactive citizens and to anticipate what may come.

Their fixed locations also mean that these homes are subject to specific geographic concerns. Place your home too close to a river and you may find yourself flooded out. Place it too far, and you will struggle to have enough water to drink and to grow with. Avalanches, earthquakes, eruptions, tsunamis and floods can all impact settlements in profound ways.

### Sapiens – A New Measurement for Population

One of the philosophical results of the French Revolution in the 1790s was a standardised set of prefixes used to conveniently multiply units of measure (grams, metres, litres) by factors of 10.

To describe populations, a new unit can easily be developed – the sapien. One sapien is one human, *Homo sapiens*. A novel vocabulary for measurement can spark new ideas of scale, reinforce our common humanity, and can help us to precisely understand just how large the human community has become.

A village of a thousand people could therefore be described as a single “kilosapien”, and a city of a million as a single “megsapien”. The most populous cities on Earth today, depending on how you measure their extent, contain almost 40 megasapiens. The countries of India and China have populations over a billion – they are gigasapiens. Our planet is currently measured at seven gigasapiens.

### Megasapiens

While it is difficult to precisely ascertain the size of cities today, it is impossible to know the size of cities in the distant past. Using indirect methods combining such fields as archaeology and agriculture, scholars have created rough estimates of urban sizes at various times in history. These numbers are subject to vigorous debate, as there is no systematic way to measure with certainty.

Ten thousand years ago, settlements reached only a few hundred people at most. As agricultural technology improved, these settlements grew rapidly. Five millennia ago, Memphis (Egypt) was a city of 30 kilosapiens, and 2,500 years ago, Babylon became the first city larger than 200 kilosapiens.



**LEFT** Solo, Central Java, Indonesia: Java is the most densely populated island in the world: Sixty percent of the population of Indonesia – about 122 million people – live here

**ABOVE** Homebound: Dhaka will to be the sixth largest megacity in 2030, after adding at least 10 million more people. None of the world's megacities comes close to Dhaka's population density. Mumbai is about one-third less dense, despite its reputation as crowded and congested. The only other megacity (minimum 10 million population) more than one-third as dense as Dhaka is Karachi, Pakistan

The first city to reach a megasapien was Rome, now the Italian capital, in the first century BC. Rome's population shrank in the first years of the modern calendar, and by 500 AD Constantinople (now Istanbul, Turkey) was the world's largest city, at 500 kilosapiens. On the other side of the continent, the Cambodian city of Angkor, as well as Kaifeng, Chang'an and Hangzhou, all in China, each reached a megasapien at some point around 1000 AD.

By the start of the 20th century, written records allow for much more precise determinations. In 1900, London, UK, was the largest city to ever have existed, at almost seven megasapiens. In 1925, it was overtaken by New York, which was the first city to reach 10





\* The population of Russia to date is 142 million. However, it did not make the list as not all of Russia lies in Asia.

## TOP 10

### Most Populous Countries in Asia

China **1.36 billion**  
 India **1.26 billion**  
 Indonesia **248 million**  
 Pakistan **184 million**  
 Bangladesh **155 million**  
 Japan **127 million**  
 The Philippines **98 million**  
 Vietnam **90 million**  
 Iran **77 million**  
 Turkey **76 million**

### Least Populous Countries in Asia

**331,000** Maldives  
**407,000** Brunei  
**593,000** Macau  
**728,000** Bhutan  
**888,000** Cyprus  
**1.45 million** East Timor  
**1.55 million** Bahrain  
**1.91 million** Qatar  
**2.86 million** Mongolia  
**3.03 million** Armenia



**LEFT** A tourist magnet and home to most of Indonesia's Hindu minority, Bali is no stranger to crowds. A 2014 census put the island's population at well over four million

**RIGHT** Nanpu Bridge, Shanghai: Construction on the Nanpu Bridge project began on December 15, 1988, and actual construction was finished by June 20, 1991. Deng Xiaoping personally inscribed the name of the bridge on a main girder. Mainly financed by the Asian Development Bank, the total cost for this project was CNY820 million (US\$128 million)











**LEFT** Indonesia has the largest Muslim population in the world, so it is not surprising that the country is home to thousands of mosques, including Jakarta's Istiqlal Mosque, Southeast Asia's largest, where thousands of worshippers come to pray

**RIGHT** Devotees take part in the Hindu festival of Thaipusam in the Batu Caves on the outskirts of Kuala Lumpur, Malaysia. Over one million people usually visit the Batu Caves on this day



megasapiens. At the turn of the millennium, Tokyo was the largest city ever seen on Earth, and the first to pass 25 megasapiens.

### Extreme Cities

What defines the most extreme city? Is it a specific place marked by imaginary lines, historical reference or natural boundaries? Is it an economic unit, a residential zone or a tribal membership? A city can be all of these simultaneously.

Following on from the analogy of a city as a living thing, one appropriate metric of an extreme city to compare the largest cities on Earth is the number of people in the urban or metropolitan area. The people are the neurons of the city's brain. This measure is not confounded by historical quirks of city borders or terrain and can be compared in our new unit of sapiens.

The eight most populous urban areas in the year 2015 are in Asia. The largest collection of humans in a single area is Tokyo (Japan), which as at 2015, contains an estimated 38 megasapiens. This is followed by Jakarta (Indonesia, 31), Karachi (Pakistan, 30), Manila (Philippines, 24), Delhi (India, 24), Seoul (South Korea,

23), Shanghai (China, 23) and Beijing (China, 21).

At 21 megasapiens, New York, is the most populous urban area outside Asia. In South America, the most extreme city is Sao Paulo (Brazil, 21); in Africa, it is Lagos (Nigeria, 17); and in Australia, Sydney, at four megasapiens.

Each of these cities has a unique character, position, history and environment. But one thing they share is that they are all alive and they are all being constantly refreshed and maintained by the thoughts and efforts of those who live there. Even the most extreme city has something in common with the smallest village – it is a living thing that is more than just the sum of its parts. ♦ AG

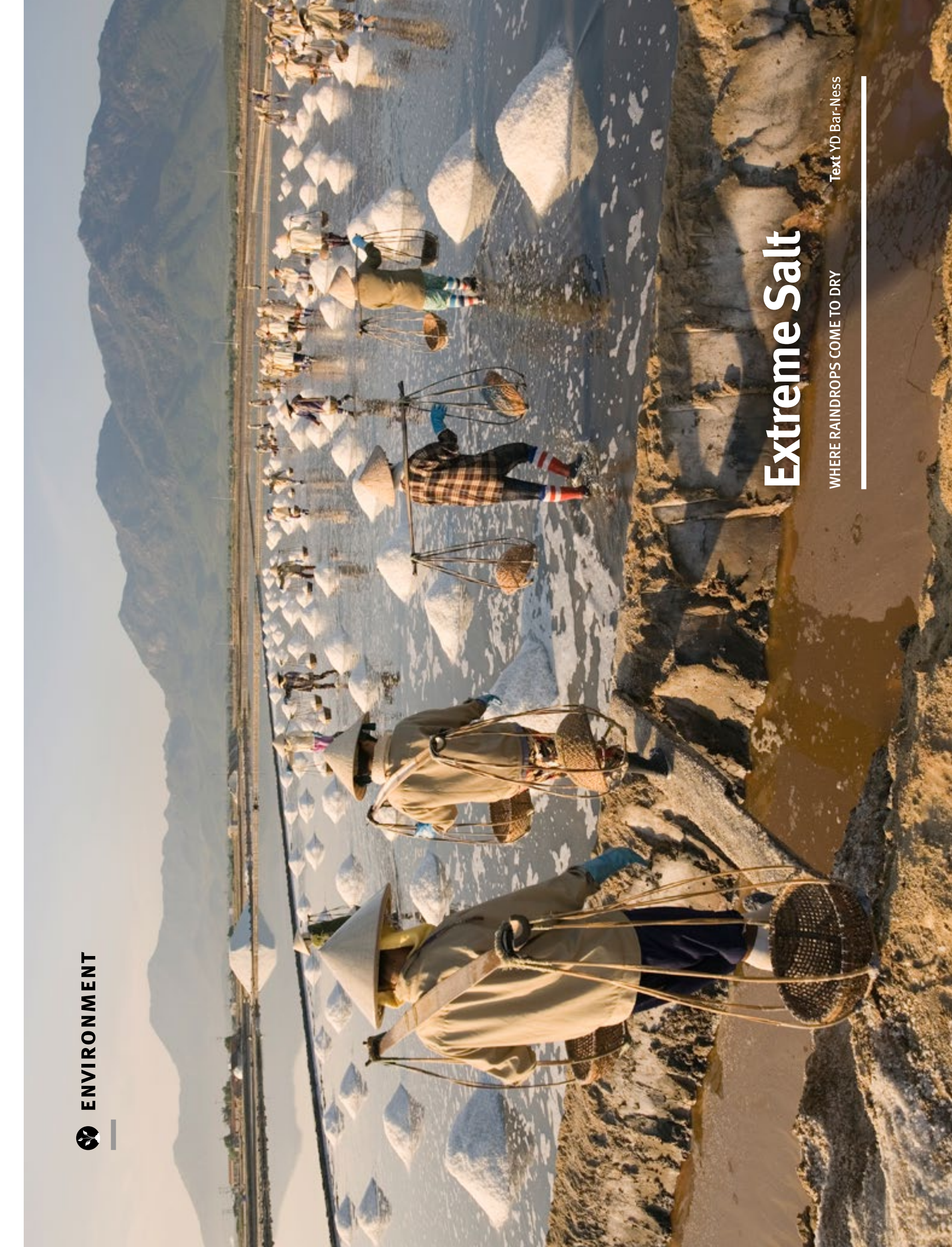
**YD BAR-NESS** is a conservation ecologist based in Fremantle, Western Australia. As a scientist, he specialises in climbing trees to explore the canopy biodiversity, and as a conservationist, he seeks to use geography and photography to create environmental education materials. [www.outreachecology.com](http://www.outreachecology.com)



# Extreme Salt

WHERE RAINDROPS COME TO DRY

Text YD Bar-Ness





**The** flattest, brightest, and most surreal landscapes are also the saltiest and the most inhospitable. On dry land, most rainwater makes its way by gravity through stream and lake and river down to the ocean. Even when it sinks into the ground out of sight, a raindrop will join the subterranean flow of water downhill to the sea.

But in some strange places, the raindrop's flow is futile and leads to no coastline. In these regions, it will rejoin the ocean only after it evaporates. The raindrop may join the waters of a salt lake, but eventually it evaporates leaving behind the minerals that it picked up on its journey. When the incoming water flow changes, a salt lake can dry out and become a flat plain – a salt pan, or salt flat. These hypersaline places seem, at first glance, alien and lifeless.

## A Geography of Salt

Saline environments can be found on all continents. They can occur in places where ocean water is trapped on dry land:

### ● Trapped ocean in depressions

The Dead Sea between Israel and Jordan is the most notable; two million years ago it was connected to the ocean. It is now the lowest dry point on Earth, at 429 metres below sea level. As the water level drops due to increased irrigation from the Jordan River, this point becomes lower and lower. On a much smaller scale, a

hypersaline pool can form in the centre of an oceanic coral atoll, such as the French Polynesian island of Niau.

### ● Receding seas along dry coasts

Known in Arabic as *sabkha*, one type of salt flat can be found as the remnants of lagoons in desert coastlines, and appears in the depressions between sand dunes.

Saline environments can also be found where rainfall cannot make its

way to the ocean, because it is caught in a low area or because it evaporates too quickly:

### ● River-fed depressions below sea level

The lowlands of the Afar Triangle in Ethiopia, the site of several famous proto-human fossil finds, are some of the lowest places on dry land. The Awash River drains into this portion of the Great African Rift and is unable to find a path out to the ocean.

**ABOVE** Salt mines near Nha Trang City, Vietnam

**BELOW** View of the salt mine at Ayad, Yemen, which is at least 200 years old. The salt is from a geological formation called a salt dome, a phenomena where ancient lake-bed salts have risen like a plume in a lava-lamp to reach the surface





### 🕒 **Inland terrestrial basins above sea level**

This occurs where rivers drain to a trapped basin, such as the Great Salt Lake of North America. These can have wildly fluctuating levels with different amounts of rain- and snowfall.

### 🕒 **Rivers and spring waters draining into dry environments**

Rivers draining into the Sahara and the Chilean Atacama desert off of the mountains can peter out before they can reach the ocean. This can also be spring water: Rainfall moving through the sandstone mountains of eastern Australia collects in the world's largest underground aquifer and spring-wells out in the arid centre to evaporate under the sun.

## Places of Extreme Salt

Found on every continent, saline locations are often associated with the deserts at 30 degrees latitude. The saltiest body of water is the Don Juan Pool in Antarctica, which is almost half salt. Its salinity is so high that it never freezes.

Several significant salt lakes are found in Asia. The world's largest lake, the Caspian Sea, is a salt lake, although it is less than half the salinity of the ocean. It is also the site of significant oil reserves, and as such is valued greatly by the bordering nations of Turkmenistan, Kazakhstan, Azerbaijan, Iran, and Russia.

To the northeast, the Aral Sea, within the former Soviet Union, was once amongst the very largest lakes in the world – but it has now nearly disappeared. Half a century ago, an ill-advised Soviet decision to dam the inflowing rivers led to a massive ecological collapse in this region. The Caspian, the Aral, and the Mediterranean are remnants of the Paratethys Sea, which connected the Atlantic with the Indian Ocean 30 million years ago.

Elsewhere in Central Asia, Lake Balkhash in Kazakhstan, Lake Urmia in Iran, Issyk-Kul in Kyrgyzstan, and Qinghai Lake in China are all amongst the very largest salt lakes on Earth. Lonar Lake in Madhya Pradesh, India, is a rare example of a pool formed by an ancient meteor strike on a large expanse of lava. Water that collects in the circular pool evaporates in the hot Central Indian Sun.

## Evaporite – What's Left Behind

Evaporite is a sedimentary rock with some similarities to sandstone and limestone. Like calcium, salt dissolves in water and is deposited in flat strata under certain conditions. When

**TOP RIGHT** Yemen: The salt mine at Ayad is at least 200 years old

**RIGHT** Rajasthan, India: a salt mine on the Sambhar salt lake







## When ocean or rainwater is trapped in a basin exposed to sunlight, the water will evaporate and leave behind an increasingly concentrated remnant of salt

**ABOVE** Only a few salt plants, such as this one in Mallorca, Spain, are active in Europe, as they are typically not cost effective to run. The drive from Colonia de Sant Jordi to the beach of Es Trenc will take you past the big white hills of Salines de Llevant

ocean or rainwater is trapped in a basin exposed to sunlight, the water will evaporate and leave behind an increasingly concentrated remnant of salt.

Several minerals evaporate from trapped ocean waters, including calcite (the ingredient in limestone), halite (table salt) and gypsum (the main ingredient of chalk). From the trapped terrestrial waters, a more exotic mixture of salts is produced: borates, sulphates, Epsom salts, and others.

Table salt, also known as sodium chloride or halite, evaporated from ocean water is an essential part of the human diet. The terrestrial evaporites are considered medicinal: health

resorts have been built on the shores of salt lakes and the deposits can have substantial economic value as cosmetic and therapeutic products. Nitrates for use in fertiliser and explosives are also found in evaporite deposits, and oil reserves are sometimes trapped by underground layers of salt.

Unfortunately, these topographical traps also collect pollution and nutrients from the uphill lands. One of the legacies humans will leave for future geologists are unexpected chemicals mixed in with salt.

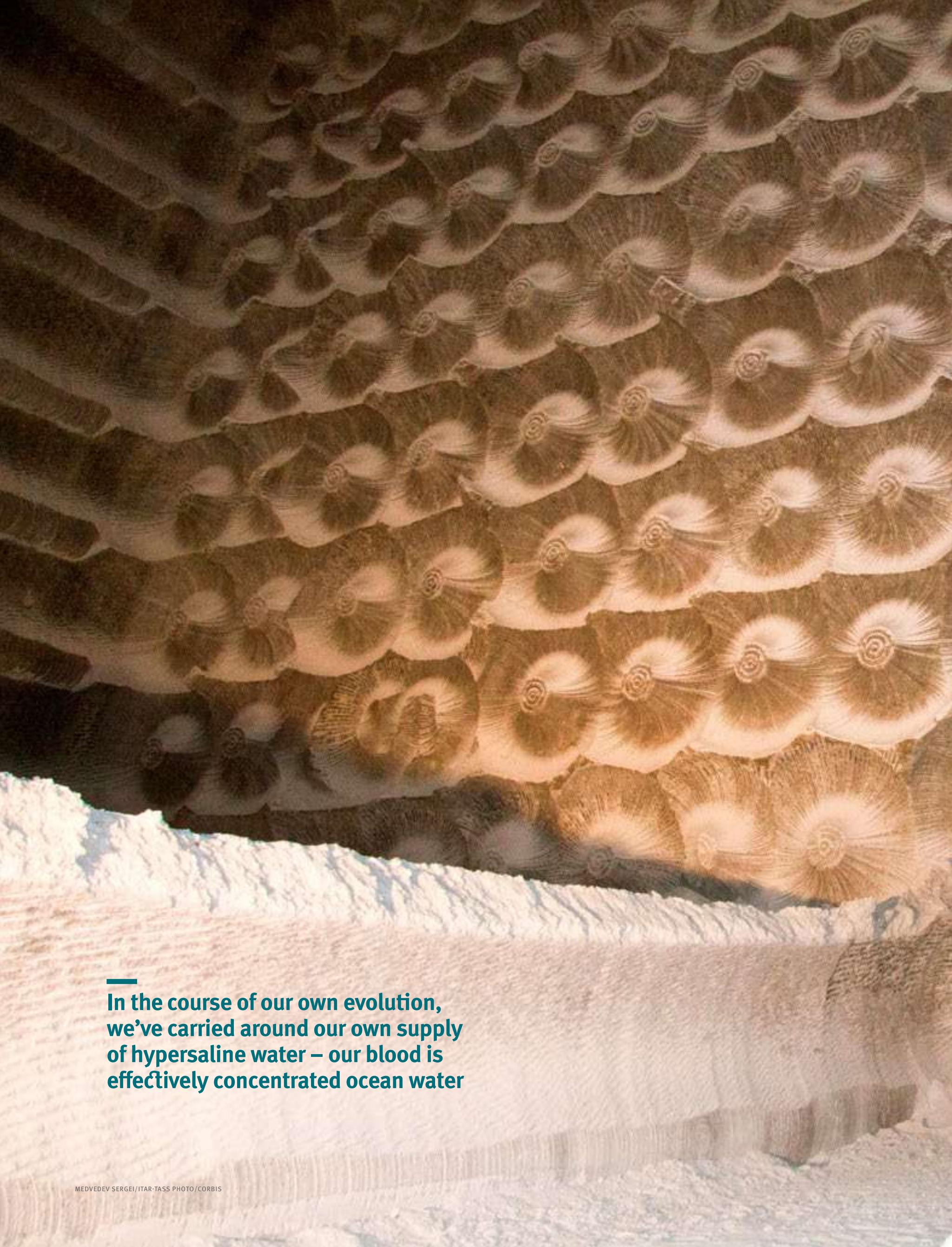
## Flats, Pillars, Domes, Caves, Glaciers

Salt can create strange shapes

and bizarre crystals that have long fascinated people. The remarkably flat salt pans or playas left behind by evaporated salt lakes are the most structurally simple places on Earth, with little in the way of vegetation or rocks. On the edges of the salt lakes and pans, salt can crystallise onto nearby rocks in an attractive crust.

Over the Earth's long history, many deep deposits of oceanic salt have been laid down and shifted within the other rock layers. Salt mines can be dug, with some of the most famous in Poland and Pakistan. Salt under pressure flows like water ice: In some situations, it is less dense than rock and can begin floating up through rock layers as a dome or plug. These domes





**In the course of our own evolution,  
we've carried around our own supply  
of hypersaline water – our blood is  
effectively concentrated ocean water**





The Iletsk salt mine, operated by Russol, OOO, in the Orenburg region of Russia





DENNIS COOPER/CORBIS, CHRISTOPHE BOISVIEUX/CORBIS

**LEFT** The Bonneville Salt Flats is a densely packed saltpan in Tooele County in northwestern Utah. The area is a remnant of the Pleistocene Lake Bonneville and is the largest of many salt flats located west of the Great Salt Lake

**BELOW** Salt worker's feet: Salar de Uyuni (or Salar de Tunupa) is the world's largest salt flat at 10,582 square kilometres. It is located in the Daniel Campos Province in Potosí in southwest Bolivia, near the crest of the Andes and is at an elevation of 3,656 metres above mean sea level



strangest and most unexpected of salt geographies: salt glaciers.

## A Concentration of Life

Salt lakes and flats have long been considered dead zones. But modern surveys have discovered rich biological activity at the microscopic level. These “halophilic” – salt-loving – microbial communities include not only diverse bacteria, but also members of a more unconventional and interesting biota. The Archaea are a broad group of organisms that are only distantly related to animals, plants, fungus, and bacteria; they include “extremophiles” that can survive in the most chemically intense places on Earth.

Like undersea volcanic vents, ice caves, and terrestrial hot springs, hypersaline environments are home to microorganisms with remarkable abilities. Salt-loving organisms have special techniques to survive ultraviolet radiation, dehydration, and salt overdose, and their discovery has shown us new directions in biochemistry. They also remind us that extraterrestrial life may thrive in unexpected locations.

In the course of our own evolution, we’ve carried around our own supply of hypersaline water – our blood is effectively concentrated ocean water. It may be that rather than being an austere zone of death, hypersaline environments are intense reminders of our own living chemistry. ♦ AG

are often associated with oil reserves, since they signal the presence of an underground “pan” upon which the oil is trapped.

It can also be pushed up by geological pressures, and arise as salt mountains or pillars such as Mount Sodom at the Dead Sea. Within these salt regions, caves can be formed in a similar fashion to the dissolving of limestone, and rare formations of stalactites can be found made entirely of salt. In the mountains of Iran, layers of salt have been exposed on steep slopes and have begun spilling out and flowing downhill in a semi-solid state. These are perhaps the



# ASIA'S LARGEST ENDORHEIC\* LAKES

## Issyk Kul

KYRGYSTAN

Surface Area: 6,236 km<sup>2</sup>  
Volume: 1,738 km<sup>3</sup>  
Elevation: 1,607 m  
Depth: 668 m

## Lake Urmia

IRAN

Surface Area: 5,200 km<sup>2</sup>  
Volume: 26 km<sup>3</sup>  
Elevation: 1,275 m  
Depth: 13 m

## Qinghai Lake

CHINA

Surface Area: 4,489 km<sup>2</sup>  
Volume: 85 km<sup>3</sup>  
Elevation: 3,193 m  
Depth: 188 m

## Caspian Sea

RUSSIA, TURKMENISTAN, IRAN,  
KAZAKHSTAN AND AZERBAIJAN

Surface Area: 371,000 km<sup>2</sup>  
Volume: 69,400 km<sup>3</sup>  
Elevation: -28 m  
Depth: 1,025 m

## Lake Balkhash

KAZAKHSTAN

Surface Area: 18,428 km<sup>2</sup>  
Volume: 106 km<sup>3</sup>  
Elevation: 341 m  
Depth: 26 m

## Lake Van

TURKEY

Surface Area: 3,755 km<sup>2</sup>  
Volume: 607 km<sup>3</sup>  
Elevation: 1,640 m  
Depth: 451 m

## South Aral Sea

KAZAKHSTAN AND UZBEKISTAN

Surface Area: 3,496 km<sup>2</sup>  
Volume: 87 km<sup>3</sup>  
Elevation: 29 m  
Depth: 40 m

## Lake Eyre

AUSTRALIA

Surface Area: 9,500 km<sup>2</sup>\*  
Volume: 48 km<sup>3</sup>\*  
Elevation: -15 m\*  
Depth: 4 m\*

\* Note these measurements are when the lake is full.

\*Endorheic refers to water bodies that do not flow to the sea. They are typically occupied by a salt lake or salt pan.









{ INDIA }

# Dried Out *Heartbreak*

◆◆◆ *The indian countryside collects its debts*

TEXT  
Zigor Aldama

◆◆◆ PHOTOS  
Miguel Candela

---

Gangamma Sake married her former husband when she was 14: Now a mother of two, she survives with help from the NGO Vicente Ferrer, which provided her with a buffalo – by selling the milk, she earns 150 rupees a day (US\$2.30), which she uses to repay the debt her husband left behind



Heavy rainfall and hail shortly before the harvesting season this year have worsened an epidemic that has claimed more than 300,000 lives in India since liberalisation of its agriculture: the mass suicide of farmers.

**BELOW** Mourner Bhagunte holds up a newspaper with the photo of his father, Boothe Prajapati, moments after his death



**On** May 14, 2015, Ramnariam Barma woke up with the firm intention of ending his life. He had long been pondering this decision and the government's refusal to compensate him for the loss of the harvest was the straw that broke the camel's back.

"We had been losing money for four years because of the drought, but this winter's heavy rains and hail have left us with nothing. I had borrowed 140,000 rupees [US\$2,200] from the bank and 130,000 more from other loan sharks to pay for seeds and for my oldest daughter's dowry, and I knew I could not return them."

So he took a rope, told his wife he was going to the field with the buffaloes and went instead to a high voltage tower near the hectare of land that he owns. He climbed onto the metal skeleton and knotted the rope. But when he put it around his neck, some neighbours saw him. "Think of your six children! What will your wife do without you?" Police also soon arrived and together, they convinced Barma not to hang himself.

But the idea continues circling his mind. Now, he fears the time when moneylenders – who have stepped up their pressure on him to pay, fearing he will soon commit suicide – will visit him at home with more than threatening words.

"Someday they will come to torture me. But I have nothing to pay them, and nobody wants to buy my land because it has proven to be quite barren. The government has promised me 9,000 rupees [US\$140] as compensation, but that cannot pay for feeding or schooling my children."

The youngest of the offspring, only 18 months old, stares at his father while he talks. He is barefoot, dressed only in tattered underwear, and shows a worrying lack of activity for a child of his age. His swollen abdomen certifies severe malnutrition. His mother, Shyambae, holds the baby on her lap and warns Barma: "If you kill yourself, I see no reason to continue living."



Parvati Shukla and Rameshwar Prasad cry inconsolably a few days after their son's death: It is still unclear if the family will receive the official compensation for Brijomohan's death – his autopsy points to cardiac arrest as cause of death, rather than from the direct effects of intentional poisoning. Since the government does not compensate natural deaths, the final decision is pending





◆ ◆ ◆

## Although the Indian economy is experiencing a golden age, the contribution from agriculture to the country's GDP is falling steadily.

In the small Indian village of Tendura, a set of dusty streets and mud houses that are home to some 8,000 people in the northern province of Uttar Pradesh, the drama of this family is not surprising. In fact, in the first five months of this year, as many residents killed themselves. And everyone in the village is convinced that the list will continue to grow because the harvest has been particularly bad, adding to four years in which agricultural production has been hampered by another endemic problem: drought.

"Most of the farmers have contracted debts that they now can't repay. Many don't see another way out,

**BOTTOM LEFT** Hair dye products can easily be found in most corner shops in rural and urban areas of India. Due to its accessibility, low cost (35 rupees) and high toxicity, desperate farmers take their lives by ingesting the product

**RIGHT** A farmer spreads wheat to dry in the sun in the rural state of Uttar Pradesh: More often than not, the extreme weather damages most of the crops, leaving farmers and families in a desperate situation

and just between March and May this year, 65 people have committed suicide in the Banda district alone," says Raja Bhaiya, director of Vidya Dham Samiti, an organisation funded by ActionAid that is launching a grain bank, "so that farmers can at least eat".

Uttar Pradesh is not the only state affected. In fact, suicide has become the deadliest epidemic in India since the country decided to liberalise the agricultural sector in the 1990s. According to official statistics – which numerous NGOs say underscore the magnitude of the problem because they don't include many cases judged as doubtful – more than 300,000 farmers have taken their lives since 1995.

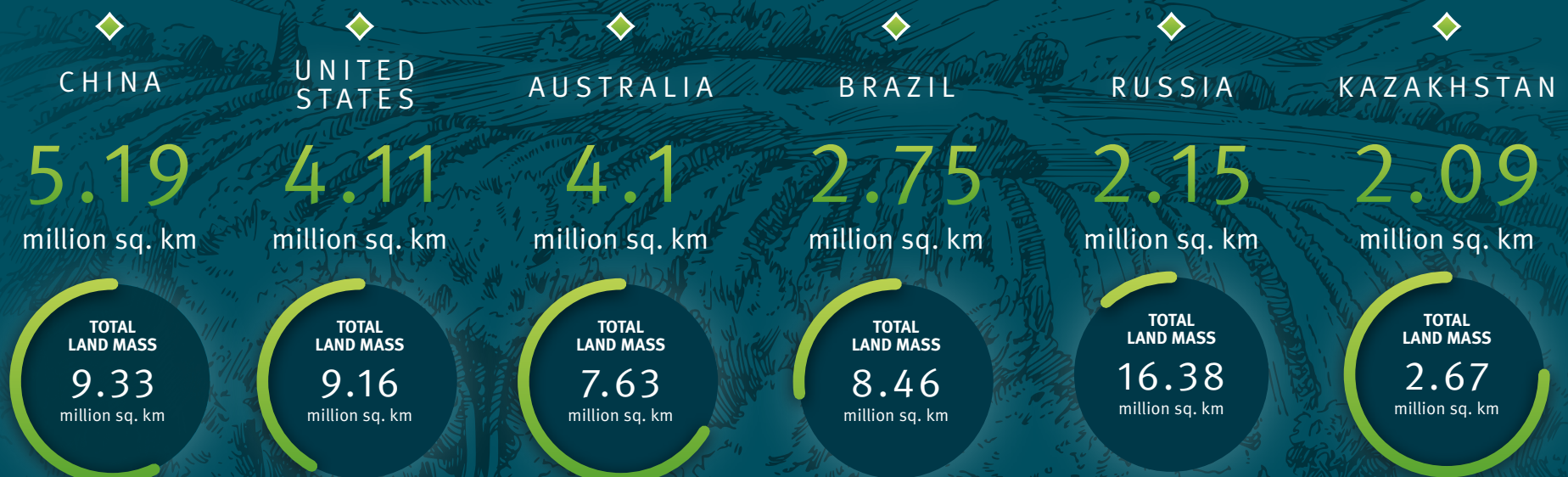
Although the Indian economy is experiencing a golden age, the contribution from agriculture to the country's GDP is falling steadily – currently at 13 percent despite providing jobs to 60 percent of the population – and 2015 is becoming by far the worst year in the past two decades. "The number of suicides has doubled in most of the towns in the state. In some, it has have even tripled," says K.S. Singh Yadav, Superintendent of Health in the city of Lalitpur, Uttar Pradesh. Thus, different specialists forecast that this year will surpass the 20,000 suicide toll.

For now, the only thing the government is doing to stop this crisis is to grant a controversial 700,000-rupee (US\$11,000) compensation to the families of farmers who take their own lives. Many consider this comparatively large payout an incentive for suicide, and sometimes it is. Bhagunte Prajapati, a 37-year-old



## TOP 10 AGRICULTURAL LAND AREA\*

(2011)



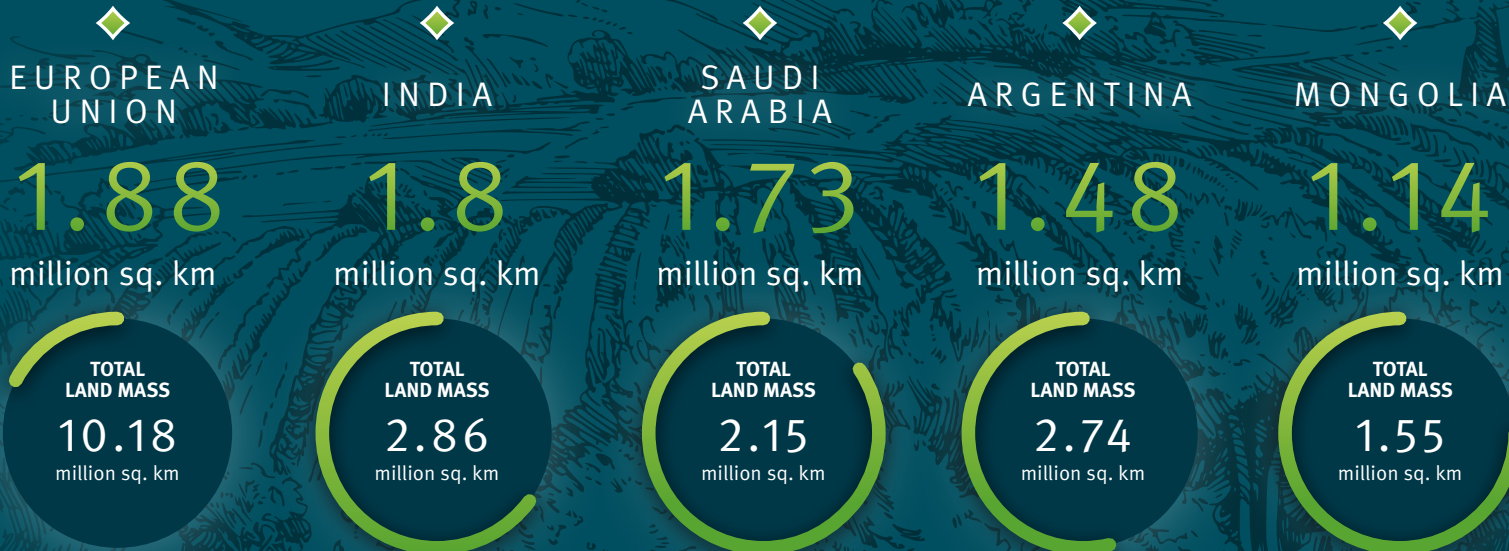




farmer, knows that well. Last March 19, he found his father, Boothe Prajapati, hanged in the family barn. He was 60, and he believed that the economic boost from the compensation after his death was the only way to help his family survive after the loss of almost all their crops.

“He had had two taciturn days, barely speaking. I found him dead when I brought him some food. I

understand his desperation, because 28 family members depend on the harvest, and we only managed to save around 300 kilos out of the six or seven tons we used to collect. That’s not even enough for our own consumption,” says his son, the eldest of six siblings and himself father of a further three children, while holding the explicit image a local newspaper used to illustrate the event. “So now we barely have enough to

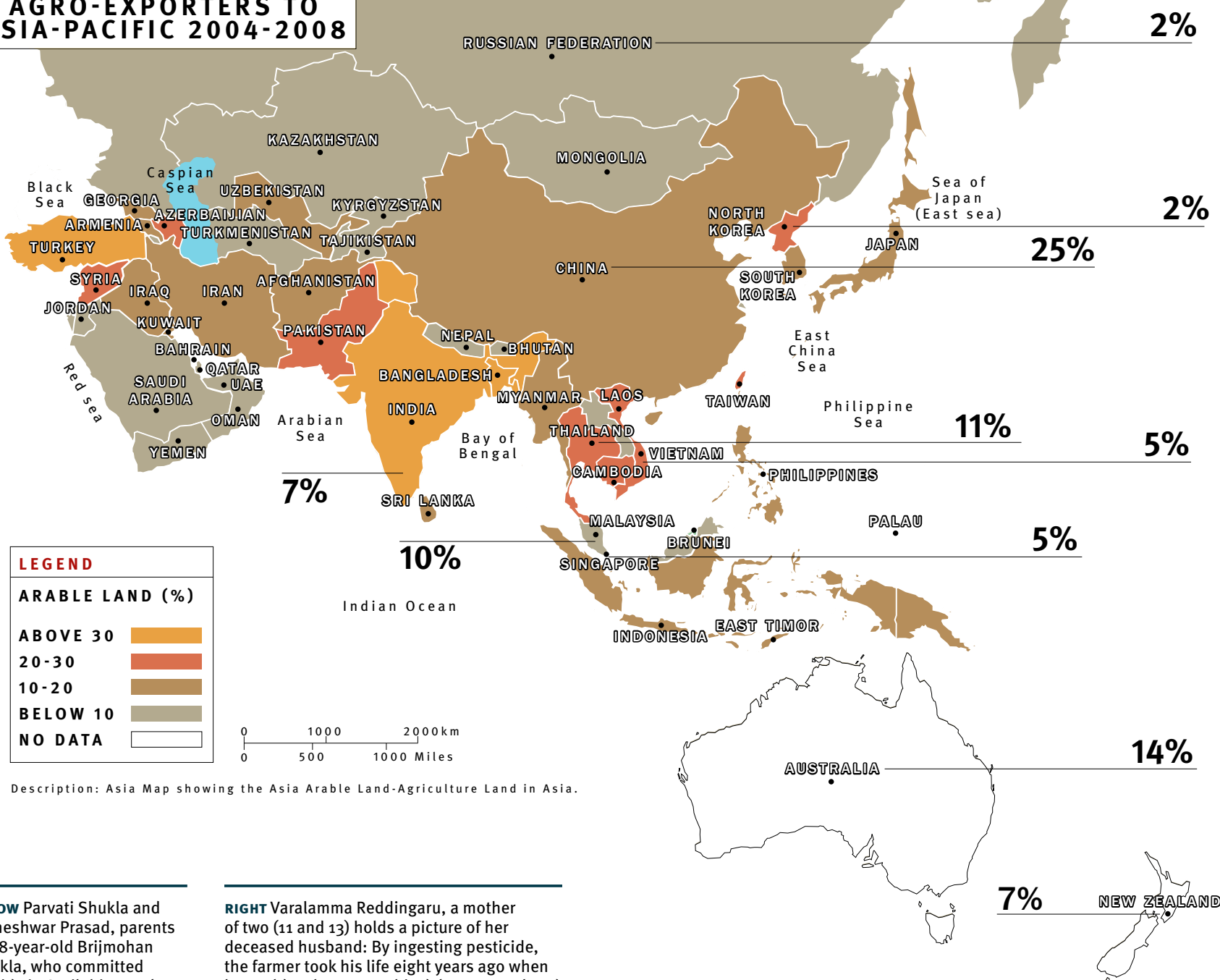


\* Agricultural land refers to the share of land area that is arable, under permanent crops, and under permanent pastures. Permanent pasture is land used for five or more years for forage, including natural and cultivated crops.

Source: [www.nationmaster.com](http://www.nationmaster.com)



# TOP 10 ASIA-PACIFIC AGRO-EXPORTERS TO ASIA-PACIFIC 2004-2008



**BELOW** Parvati Shukla and Rameshwar Prasad, parents of 28-year-old Brijmohan Shukla, who committed suicide in April this year by drinking hair dye

**RIGHT** Varalamma Reddingaru, a mother of two (11 and 13) holds a picture of her deceased husband: By ingesting pesticide, the farmer took his life eight years ago when he could no longer pay his debts accumulated from the cost of his tuberculosis treatment coupled with the failure of his crops



eat, and we will have to ask for another loan to cultivate the land next year. If we don't get it, I don't know what we can do."

The Prajapati family has already begun the complicated procedures to apply for government compensation, but they don't know if it will be granted. "We are expecting the bank to write off [my father's debt], but he didn't tell us how much he had borrowed from local loan sharks, which generally accumulate an interest of 10 percent per week. We will have to negotiate with them when we are given the compensation."

If they actually get it, that is, because the government does everything possible to prevent suicide cases being certified as such. "We aren't worried because the autopsy showed that he hanged himself and the press has published his photograph, but other people have taken their lives in vain."

A doctor at the public hospital in Lalitpur, who requested not to be named, acknowledged that is true.





“It is difficult to deny the obvious when someone has hanged himself or cut his wrists, but it is easier in cases of poisoning.” And many of the farmers, around 40 percent of those who commit suicide, choose to do so by drinking pesticide or hair dye. Brijmohan Shukla was one of them. On April 10, he decided to drink the chemical-laden hair dye Indians often use to darken their hair. He was only 28 years old.

“Some kids found him lying on the side of the road. He had been vomiting something black, and was already dead,” recalls his mother, Parvati Shukla. “But at the hospital they said he died of natural causes.” The autopsy attributes his death to a cardiac arrest, and that’s why Brijmohan’s parents will not receive any compensation.

“It is true that intentional poisoning can eventually cause death from a heart attack, but it is also true that there are some families trying to pass [off] a natural death as suicide to collect the compensation,” says Singh Yadav. Parvati, however, claims they are

not trying to take advantage of the law. “My son was under too much pressure. The bank had begun to send notifications to demand repayment of a loan, and we had arranged his marriage to a girl from a nearby village. But the harvest had been much worse than expected and we have not received any help.”

“A few days earlier he had told me he did not want to live like this, but I thought I had convinced him not to do anything stupid,” she says, unable to hold back her tears. “This is how the land collects our debts here.” ♦ AG

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**ZIGOR ALDAMA** is an award-winning journalist based in Shanghai, China, where he works as correspondent for Vocento, Spain’s largest media group. He has been covering social issues in the Far East since 1999 and the Indian suicide crisis since 2013.

Winner of Best Essay and Feature at the 2011 IPA Awards and Best New Talent at the 2012 Prix de la Photographie (PX3), Hong Kong based Spanish photographer **MIGUEL CANDELA** has specialised in social features across Asia. He uses photography to capture our present as a historical moment.





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The coldest permanently inhabited place on Earth: Yakutsk, Russia: The broken landscape of Stalin's Kolyma Highway, also known as "The Road of Bones"



# Extreme *Asia*

◆◆◆ *Top 10 most intense places in the world*

◆◆◆ BY  
Jenifer Yeo



The incredible diversity found in Asia is not limited to its long heritage and plethora of cultures. This vast region is also home to the world's most extreme geography and manmade structures. From the lowest point on Earth, we soar to the highest summit, and discover far-flung locations of the world that claim the titles of coldest, hottest, driest and deepest.

## Hottest *Point*

**Lut Desert**  
IRAN



Located in the southeastern region of Iran, this large salt desert lays claim to being the hottest place on the planet with the highest temperature, recorded by NASA satellite, at a sweltering 71°C. The hottest point is a dark lava plateau called Gandom Beryan, which covers an area of around 480 square kilometres.



## Coldest *Inhabited Place*

**Oymyakon**  
RUSSIA



Oymyakon is situated along the Indigirka river in the Oymyakonshy district of Russia's Sakha Republic. This village, which has a total population of about 800 people, is known to be the coldest permanently inhabited place on Earth, with a recorded low of minus 71.2°C in 1924. Only Antarctica has recorded lower temperatures.



## Driest *Place*

**McMurdo Dry Valleys**  
ANTARCTICA



The driest place on Earth, located in the interior region of Antarctica, is appropriately named the Dry Valleys. These snow-free valleys have not experienced rainfall for more than two million years. Only one of the valleys contains water – lakes fed by inland rivers flowing during the summer season. Katabatic winds, with speeds of 320 kilometres per hour, are responsible, in part, for evaporating all the moisture. The valleys make up the only Antarctic region that has no ice.





## Deepest *Point*

### Mariana Trench PACIFIC OCEAN



At 10,924 metres below sea level, the Challenger Deep, at the floor of the Mariana Trench, is known to be the deepest part of the world's oceans. If the highest mountain in the world, Chomolungma (Mount Everest), were positioned at the Mariana Trench, more than one mile of seawater would cover it. The few manned and unmanned vehicles that have surveyed the Challenger Deep have discovered various life forms, including sea cucumbers, worms and numerous microorganisms.



## Lowest Elevation *On Land*

### Dead Sea ISRAEL



The surface of the Dead Sea, at the border between Israel and Jordan, is some 423 metres below sea level, the lowest altitude on land anywhere on Earth. The road leading to the sea is considered the lowest road on the planet. The Dead Sea is well known for its high concentration of salt, which is 10 times higher than that of the Mediterranean Sea, and as a result, no fish or aquatic plants can survive here. Aside from its salinity, the sea attracts people from all corners of the globe who believe its waters have healing properties.



## Highest *Motorable Road*

### Mana Pass INDIA/CHINA



At 5,610 metres at its highest point, the world's highest road accessible by transportation is probably Mana Pass, on the India-China border, which was built between 2005 and 2010. (Semo La in Tibet, at 5,565 metres, and Marsimik La in India, at 5,582 metres, are other contenders.) The area also takes the title of having the highest railway in the world, at Tanggula Pass. Located in the Tanggula Mountains, straddling Qinghai and Tibet, China, the track reaches some 5,072 metres at its highest point. Tanggula Railway Station is the world's highest, at 5,068 metres. Before the Qinghai-Tibet Railway was built, the highest railway ran between Lima and Huancaayo in Peru's Andean mountains, reaching 4,818 metres at Ticlio.





# Highest *Glacier*

Khumbu  
Glacier  
NEPAL



On the southwestern slopes of Everest is the Khumbu Glacier, the world's highest, with elevations of 4,900 metres at its terminus to 7,600 metres at its source. Located in the Khumbu region of northeastern Nepal between Chomolungma and the Lhotse-Nuptse ridge, the glacier is followed for the final part of the trail to Everest Base Camp. The glacier has a large icefall, the Khumbu Icefall, at the west end of the lower Western Cwm, which is the first major obstacle on the standard South Col route to Chomolungma's summit.



# Highest *Mountain*

Chomolungma  
NEPAL/CHINA



What has not been said about Chomolungma or Sagarmāthā (Mount Everest) in almost every language? Located in the Mahalangur section of the Himalayas, this 8,848-metre phenomenon of Nature remains the ultimate dream of climbers the world over. Chomolungma's summit was first reached on 29 May 1953 by Nepalese Sherpa Tenzing Norgay and Edmund Hillary of New Zealand.

ROBERT HOLMES/CORBIS, JENNY KENNARD/IMAGE SOURCE/CORBIS, JIANG HONGJING/XINHUA PRESS/CORBIS





## Highest *Civilian Airport*

**Daocheng  
Yading Airport**  
SICHUAN, CHINA



At 4,411 metres above sea level, Daocheng Yading is the world's highest civilian airport, surpassing the previous record holder, Qamdo Bamda Airport, in Tibet, at 4,334 metres. Construction started in April 2011, with a total investment of 1.58 billion yuan (US\$255 million), and the airport was opened on September 16, 2013. The inaugural flight was Air China flight 4215 on an Airbus A319 from the provincial capital Chengdu, carrying 118 passengers.

The opening of the airport cut the journey time between Daocheng and Chengdu to one hour, which previously required a two-day bus trip. The airport is part of a Chinese government development scheme to build 97 airports across China by 2020. By then, authorities can claim that four-fifths of China's population will be within a 90-minute drive of an airport.



## Highest *Helipad*

**Sonam**  
SIACHEN GLACIER,  
INDIA



At a height of 6,400 metres above sea level, Sonam is the highest helipad in the world. It is located on the Siachen Glacier in the eastern Karakoram Range in the Himalaya Mountains, just northeast of the point NJ9842, where the Line of Control between India and Pakistan ends. In total, India and Pakistan have about 150 manned outposts along the glacier, with some 3,000 troops each. India built the helipad on the glacier at Sonam to supply its troops. The problems

of reinforcing or evacuating the high-altitude ridgeline have led to India's development of the HAL Dhruv Mk III helicopter, powered by the Shakti engine, which was flight-tested to lift and land personnel and stores from the Sonam post. India also installed the world's highest telephone booth on the glacier. In winter, temperatures here can plummet to minus 70°C.





# India Wants Toilets for All

WHEN YOU GOT TO GO, YOU GOT TO GO

By Zigor Aldama



Prime Minister Narendra Modi is resolved to end the open defecation 590 million Indians still practise. We visit a village where soon every family will have a latrine thanks to his “Clean India” project.

**Until** a few weeks ago, Rangudunaik Sugali had never felt the need for a toilet. He couldn’t understand why he should spend money on such a facility if his family could meet their physiological needs out in the field for free.

And he is not the only one: Around 590 million Indians defecate in the open. That is almost half of the country’s population and also 50 percent of all people in the world without access to a latrine. It’s not only a shame for India, but also the source of disease and abuse.

And that’s why the new Indian Prime Minister, Narendra Modi, has launched the ambitious *Swachh Bharat Abhiyan* (Clean India Mission), which includes the construction of 110 million toilets across the country between now and 2019, at an estimated cost of about US\$31 billion.

“Sanitation is more important than independence,” Mahatma Gandhi said. However, the country’s last census – conducted in 2011 – showed





**LEFT** Venkateshnaik Banavathi paints the concrete for a nicer finish on their latrine. His wife is very happy with it, but he is worried the government subsidy may never come

**ABOVE** Savithramma Sugali and her husband Rngudunaik (right) are building their latrine with the help of a construction worker they've hired to help them. A civil servant will confirm that they've fulfilled all requirements and 15,000 rupees will be transferred to their newly opened bank account

**BELOW** Shyoji Ram, mayor of the small Rajasthani town of Dehelud, proudly poses with the national award he got in 2009 for making the village the first to build a latrine for all of its residents. He had to overcome a lot of criticism, but now they are all proud of the achievement



that only 32.7 percent of households have access to a basic latrine. That figure would be considered outrageously high in Pendlimanu, a dusty village located in the southern province of Andhra Pradesh where Sugali's family live among other 65 households. But things are about to change, because it's one of the first places where the project has started. Everybody has applied for the financial aid promised by the government and all hands are on deck working on it, literally, because they're building the toilets themselves.

"A 15,000-rupee (US\$230) subsidy is given for each latrine if



“Psychologically, there is the humiliation involved if one is seen doing it; then we must take into account diseases that can be transmitted this way, and the abuses that women... are exposed to.”



it meets the minimum established requirements. This means that its size must be at least four by six feet and it must have two tanks,” explains Sagar Murthy, director of the Construction Department at the Rural Development Trust, the NGO entrusted by the government with the task of convincing the population of the Anantapur region to participate in the *Swachh Bharat*.

If they succeed, by November, Pendlimanu will eradicate open defecation, and with it,

many associated problems. “Psychologically, there is the humiliation involved if one is seen doing it; then we must take into account diseases that can be transmitted this way, and the abuses that women, who often have to go at night, are exposed to,” Murthy says.

The scourge of sexual abuse knows no age, nor is it unique to rural areas. In fact, a study from 2011 found numerous cases of girls under 10 who were raped while searching for a public toilet in the slums of the capital,

New Delhi, and the report transcribed interviews with some of their mothers telling of how they had to confront their attackers and be exposed to a violence that can be fatal. In addition, the stigma and lack of police and legal protection haunting the victims means that many of them don’t even report the incidents.

That’s why Balamma Banvath is now happy. Two weeks ago, they finished building the toilet that her three daughters demanded with increasing insistence. “They have



**LEFT** Residents of Pendlimanu now proudly show their toilets, which few had before the “Clean India” programme began. But some are still unaware of the procedures for cleaning the septic tank and have doubts about their maintenance

**BELOW** The lack of water is a problem to keep the latrines working. In Pendlimanu, people have to walk almost a kilometre to the nearest well. Nonetheless, most are willing to make the trip in order to avoid the problems of open defecation



toilets in the school and know the difference. So we didn't think twice when we learned about the national programme to build them," she recalls. "Now, we don't have to be embarrassed during the day or expose ourselves to the snakes at night. Because a woman from the village was bitten and she almost died."

Next door, Venkateshnaik Banavathi is not very happy. He still doesn't believe the government will reimburse him the promised 15,000 rupees. "We have invested 18,000

because we hired a bricklayer and have chosen a better finish," he explains, while still covering the cement with a red coating that adds a touch of colour and a silky texture.

"There is a lot of corruption and it gives me the impression that the plan is full of bureaucracy. Of course it has driven us to build the toilet, because until now, we had not done it due to economic reasons, but I'll have to get the money to believe this is for real," he says, still suspicious. His 17-year-old daughter, however, isn't worried

about it. "Whatever the cost, I'm grateful. I think it is a necessity in a 21st-century India." ♦ AG

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**ZIGOR ALDAMA** is an award-winning journalist based in Shanghai, China, where he works as a correspondent for Vocento, Spain's largest media group. He has been covering social issues in the Far East since 1999 and the Indian suicide crisis since 2013.



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## POST REPORT

By Felicia Liu



# ASIAN GEOGRAPHIC HOT SOUP CHALLENGE 2015

PUTTING SCHOOLS IN HOT SOUP

What it means to be Asian



With Singapore's 50th year of independence, Asian Geographic paid homage to this progressive little island we call home with a special SG50 edition for this year's Asian Geographic Hot Soup Challenge school quiz questions. Of course, gruelling questions on Asia's diverse and dramatic heritage and history still remained a mainstay.

Held at Singapore's \*SCAPE The Treetop on July 11, 2015, the competition brought together 32 teams from various schools around Singapore, all bursting with excitement to show off their knowledge on the Asian region. Kicking off with a brand new quiz format this year, all teams took part in the first three rounds of the competition, with the top three scoring teams battling for the prestigious Guardians of the Champions Cup in the Grand Finals.

The event was graced by Guest-of-Honour, Mr Baey Yam Keng, Member of Parliament for Tampines GRC. Mr Baey shared

interesting anecdotes and his thoughts on educational programmes and the youths of today. Joining in the fun, Mr Baey also became gamemaster by quizzing the students in an NDP Funpack segment and gave away five coveted NDP Funpacks.

This year's quiz challenge included multiple-choice questions on Asia and Singapore, the naming of heritage and landmark sites on a map of Asia and a test of knowledge on Asia's unique spices, culture and religion.

In the midst of battling it out, the students were treated to a series of educational talks. In "The Dorsal Effect", Ms Kathy Xu shared about providing alternative livelihoods to shark fishermen in Lombok through ecotourism for shark conservation. Ms Foo Min Li, Senior Manager of PSM (Preservation of Site and Monuments) spoke about "Monuments in Our Midst", including interesting stories and the diverse styles of Singapore's National Monuments and how they reflect the immigrant roots of the

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builders. Tickets to “The Deep” exhibition at the ArtScience Museum were also given out as prizes during a pop quiz at the end. Lunch for the day was by KFC, the official food sponsor.

The top three teams in the Asian Geographic Hot Soup Challenge were revealed to be from Raffles Institution and two teams from Hwa Chong Institution, who then went head to head in a nail-biting Grand Finals clash. Raffles institution were crowned champions – for a second time – and won an educational trip to Lombok, Indonesia, sponsored by Kebun Villa & Resort, as well as Silkair.

Each student went home with a bountiful goodie bag consisting of Link Hotel’s totebag and lifestyle essentials, Pilot Pen’s Downforce and Juice pens, and Brand’s Essence of Chicken, among many other items. ♦ AG

WINNER	FIRST RUNNER-UP	SECOND RUNNER-UP
<b>Raffles Institution</b>	<b>Hwa Chong Institution</b>	<b>Hwa Chong Institution</b>
Timothy Lim	Alvern Mak	Joel Tan
John Cai	Ernest Ng	Teo Jer Rei
Paul Keh	Ho Choong Kai	Toh Wei Chuan
Joshua Chin	Wayne Koh	Tang Han Shin
Teacher-in-charge:	Teacher-in-charge:	Teacher-in-charge:
Mr Jason Lai	Mrs Grewal	Mrs Grewal

“It was certainly challenging this year; we’ve learnt a lot about Singapore’s history and Singapore’s place in Asia. The magazine itself has a lot to share with enriching content. Being Asian, it has been great to learn more about Asia.”

– Raffles Institution Team, 2015



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# Making Moments Count

AMONG MANY FIRST



## A travelling heritage

Represented in 160 countries across five continents, Tissot is the largest traditional Swiss watch brand based on volume. Tissot celebrates its 160th anniversary with a watch first created for its centenary in 1953: the Tissot Heritage Navigator. This ultimate traveller's timepiece features 24 time zones indicated by the capital cities on the dial, perfectly illustrating the spirit of travel with a timeless, classic look.

## Global timing

The Tissot Heritage Navigator exudes vintage class yet has all the elegant functionality of the modern businessman's tool. This timepiece provides the ultimate automatic chronometer precision, officially certified by COSC (Contrôle officiel Suisse des Chronomètres), ensuring you'll always be on time – no matter where you are on the globe.

### Features

- Swiss made
- Automatic chronometer movement officially certified COSC
- 316L stainless steel case with engraved see-through case back
- Domed scratch-resistant sapphire crystal with antireflective coating
- Water resistance up to 30m/100ft
- Leather strap with folding clasp with push-buttons
- Numbered edition
- Price: \$2,220 (Black dial)

## In touch with its time

First to present a touch-screen watch powered by solar energy, confirming its position as leader in tactile technology in watchmaking, the Tissot T-Touch Expert Solar is a very sophisticated watch in every aspect.

## Straight to the design

In touch with the technology it bears, the Tissot T-Touch Expert Solar's design is truly modern and dynamic with strong lines, whether straight or angular.

### Features

- Swiss made Solar quartz movement with accumulator charge indicator
- Tactile scratch-resistant sapphire crystal with antireflective coating
- Antimagnetic titanium case with black PVD coating
- Water resistance up to 100m/330ft
- Rubber or titanium strap with folding clasp and push-buttons, leather or leather and fabric bracelet with butterfly clasp and push-buttons



## Modernity with whispers of vintage

The Tissot Tradition is the brand's first-ever analogue perpetual calendar timepiece, making the sophistication of the finest Swiss watchmaking surprisingly accessible. The seamless combination of beautiful design and unrivalled technical expertise exemplifies the deep-rooted Tissot tradition of innovation, masterfully blending unmatched ease of operation with timeless looks.

## Ultra-modern with a touch of nostalgia

The new Tissot Tradition collection sets new standards in harmoniously marrying ultra-modern and nostalgic elements. Complementing the elegant appearance is excellent wearer comfort due to a slender, contoured form. This timepiece offers levels of quality and finesse that are otherwise unknown in its price segment.

### Features

- Swiss made quartz movement
- Domed scratch-resistant sapphire crystal
- 316L stainless steel case
- Water-resistant to 30m/100ft
- Leather strap with butterfly clasp
- Rose gold colour execution is PVD coating
- Price: S\$690 (white dial, brown leather strap)



# A Case of Forest Gumption

FROM ENVIRONMENTAL DISASTER TO ECOLOGICAL HEALTH

Text Selina Tan

Advisor Gerald Marten, author of *Environmental Tipping Points: A New Paradigm for Restoring Ecological Security*

**Three** hundred years ago, Japan's rapacious deforestation was fast turning the nation's landscape into a wasteland – a consequence of unsustainable forest usage that had been building up for a long time. As far back as 600–850 AD, construction boomed in the former capital cities of Nara and Heian (modern-day Kyoto), causing serious environmental damage in the ancient Kinai region.

Exploitive use of forests worked as long as Japan's population was small. The rulers' demands for timber to be supplied to armies and building authorities for the sake of erecting castles and religious monuments led to severe local deforestation. Yet, the nation managed by shifting the logging to new areas with "old-growth" forests that contained an abundance of large trees for high-quality timber.

However, the situation took a turn around 1570. By then, Japan's population had increased to 10 million people. In addition, large-scale

military conflict during the 1500s fuelled the need for large quantities of timber. With the advent of the Tokugawa shogunate and peace, followed by the rapid growth of cities, logging during the 1600s expanded to a scale never before experienced in Japan. By 1670, the population hit nearly 30 million and with the exception of Hokkaido, most old-growth forests had been completely logged.

The transition from unsustainable to sustainable forest use began during this time. Until then, village cooperation had not extended to forest management, but villages started responding to the forest crisis by refining the management of *satoyama* (arable flat land) secondary forests and creating *sugi* (*Cryptomeria japonica*) and *hinoki* (*Chamaecyparis obtusa*) plantations to continually provide timber.

The tradition of tree plantations in turn stimulated a need for silvicultural technology to care for the trees.

Local woodsmen, agronomists and government forest officials developed new techniques for producing *sugi* and *hinoki* seeds, planting cuttings, as well as thinning and pruning of the plantations' trees. Itinerant scholars wrote manuals on developing silviculture and new experts travelled the country, spreading knowledge across rural areas.

Managed forestry continued to boom, giving rise to a series of mutually reinforcing changes such as new social institutions for forest land use that slowed down deforestation. Community management was a tipping point that launched a new era of professional silviculture, which spread from village to village, ultimately restoring Japan's forests and averting an ecological disaster. Reforestation finally reached completion in the 1920s, placing the country in a strong position for economic development during the 20th century. ♦ AG





# On the Precipice of Awesome

PARO TAKTSANG, AN ASIAN ICON REMEMBERED

By Alvin Tan

**Ten** kilometres to the north of Paro on a precipitous cliff at 3,120 metres, about 900 metres above Bhutan's Paro valley, on the right side of the Paro Chu (*chu* means, "river" or "water" in Bhutanese), there are immensely steep rock slopes – almost vertical. On many days, clouds shroud a formidable monastery complex built into the rock face, creating an eerie sense of remoteness.

There is an interesting tale behind the original construction of the ancient temple known as Paro Taktsang. According to popular

legend, Padmasambhava, who is credited with introducing Buddhism to Bhutan, arrived here in the eighth century on the back of a flying tigress, and proceeded to meditate in one of the caves found along the cliff. Various saints and eminent figures would come to the place over the following centuries, and in 1692, then-ruler Gyalse Tenzin Rabgye finally began construction on the "Tiger's Nest" monastery devoted to Padmasambhava.

The monastery buildings comprise four main temples and residential

shelters, which are carefully designed around the caves and rocky terrain. Four of the total of eight caves are relatively easy to access. Tholu Phuk is the cave where Padmasambhava first entered, riding the tigress, and Pel Phuk is the original cave in which the guru resided and meditated.

All the buildings are interconnected by staircases with steps carved into the rock, and almost every single building in the complex has a balcony with a breathtaking view of the surrounding area. The *mani lakhang* housing a prayer wheel is an important spot near the monastery. Every morning at 4am, monks rotate the prayer wheel to mark the beginning of a new day.

The precariously perched Paro Taktsang remains one of the most extreme examples of ancient Asian architecture. Shrouded in myth and legend, it is more than just a cultural icon of Bhutan; as one of the region's holiest places, it is a spiritual focal point that seeks to define the essence of what it means to be Asian. ♦ AG



ASIAN  
Geographic

TRAVEL WITHOUT BORDERS

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No. 40  
Issue 5 | 2015



Zanariah Salam/Room the Agency/Corbis

Horse riding towards  
Mount Bromo

02 INDONESIA

## The Glory of Gunung Bromo

08 PEDY, SOUTH AUSTRALIA

## Spirit of the Land





INDONESIA

# THE GLORY OF GUNUNG BROMO

WHAT'S IN THAT VOLCANO?

—  
*text*  
BANG GENG





The Milky Way over  
Bromo Tengger Semeru  
National Park





## GETTING TO BROMO

### FLIGHT INFORMATION:

Fly SilkAir from Singapore Changi Airport to Surabaya Juanda International Airport. Surabaya is well served by regular domestic flights from Jakarta and Bali and by regional flights from various countries in Asia. Abdul Rachman Saleh Airport at Malang is a small domestic airport with flights from Jakarta only, and access from here makes sense if you intend to enter the park via the Tumpang/ Ngadas route.

### HOTELS:

Cemoro Lawang  
Hotel Bromo Permai  
+62 335 541021  
Lava View Lodge  
+62 335 541009

Sukapura  
Java Banana Bromo Lodge  
[www.java-banana.com](http://www.java-banana.com)  
Grand Bromo Hotel (formerly Hotel  
Raya Bromo),  
+62 31 7329945

Tosari/Wonokitri  
Bromo Cottages  
[www.bromocottages.com](http://www.bromocottages.com)  
Bromo Surya Indah Homestay  
+62 343 571049

### CURRENCY:

Indonesian Rupiah (US\$1 = IDR 13,900)

Sometimes, it is not the highest of landforms that conquer. Many who have journeyed all the way to the nearby mountain village of Cemoro Lawang, expecting to set foot on a record-holding peak, are surprised to hear otherwise. Yet, without exception, every one of them leaves with a part of Gunung Bromo implanted in their soul.

I am part of the Tengger ethnic minority group. Our people live around Gunung Bromo in East Java, Indonesia. According to legend, we are the direct descendants of the Majapahit Empire. The name “Tengger” comes from a combination of the names of our two founders: Joko Seger and Roro Anteng.

During the rule of the Majapahit Empire, believers of Lord Brahma worshipped on the famous Mount Bromo and went there to meditate. They believed it was a sacred place where Lord Brahma dwelled and where he could be contacted through meditation. To this day, our community follows the Hindu religion and subscribes to traditional methods of farming. We inhabit around 30 villages in the isolated Tengger Mountains within the Bromo Tengger Semeru National Park.

The magic of Gunung Bromo isn't just the active volcano itself. The surroundings, made up of colourful, dramatic landscapes, complete

02



Julien GARCIA/Photononstop/Corbis



Martin Benik/Westend61/Corbis

**02** Tourists and locals with their horses at the foot of Mount Bromo with Mount Batok in the background

**03** Tourists walk down to the Pura Luhur Poten Hindu temple

**04** The glorious Bromo 2,329m and Semeru 3,676m volcanoes seen here in the early hours of the morning

**05** The Tenggerese are a native ethnic group who live in the Bromo Tengger Semeru National Park

03





Tuul & Bruno Morandi/Corbis

04

the picture – as if painted on a vast canvas millions of years ago. At an elevation of 2,329 metres above sea level, the mist gives way to an elusive charm as one ascends. Located in four regions, namely Probolinggo, Pasuruan, Lumakang and the District of Malang, Mount Bromo sits in the middle of a vast plain known as Laut Pasir (Sea of Sand), a protected nature reserve since 1919.

Mount Bromo is easily the most identifiable volcano from afar, as the entire top has been blown off from a major eruption. The crater inside constantly belches white smoke. Lush green valleys embellish the massive Tengger caldera – with a diameter measuring some 10 kilometres – that houses Mount Bromo.

Cemoro Lawang, situated at the northeastern edge of the caldera, is the major access point to the volcano. One can walk a distance of three kilometres down the crater wall and across Laut Pasir to its slopes. After climbing more than 200 steps, you will come face to face with Gunung Bromo’s innards. Cast your gaze downwards and spot a temple in their midst, enabling one to connect freely and spiritually with the forces of Nature.

Even to a local, the sensation feels familiar yet foreign, interwoven as it is with a history beyond mortal understanding. Breathless from both the panoramic sight and the climb, one is obliged to take some time here in contemplation before making the descent. **AGP**

DID YOU KNOW?  
**LEGEND OF  
THE MOUNTAIN**

Javanese folklore has it that during the 15th century, Princess Roro Anteng (daughter of the Majapahit King Brawijaya) and her husband Joko Seger fled marauding Islamic forces, finally taking refuge at Mount Bromo. Here they developed a new kingdom, and named it Tengger using parts of their respective surnames.

The Kingdom of Tengger prospered and their religion flourished, but the royal couple was unable to produce an heir to the throne. In desperation they prayed and meditated on Bromo for many days before the crater opened and the almighty god Hyang Widi Wasa announced that they would be given children – on the condition that the last born was to be sacrificed back to the mountain.

No fewer than 25 children were produced, but many years later Roro and Joko could not bring themselves to sacrifice their last born, Prince Kesuma. A catastrophic eruption of Bromo followed and Kesuma fell the crater. To appease the great God, Kesuma’s brothers and sisters held an offering ceremony at the crater once every year, and this still happens today – the famous Upacara Kasada, held on the full moon of the 12th month (Kasada) of the Tenggerese calendar.

**BANG GENG**



Bang Geng is the owner of Tengger Homestay Bromo, located in the village area of Wonokitri and within 12 kilometres to the summit of Mount Penanjakan, a popular sunrise-viewing spot. He speaks Tengger Javanese and believes Mount Bromo to be a holy mountain.



Rismiyanto/Alcibbum Photography/Corbis

05



# Top 5 places to visit in Bromo



Wisnu Purnomo Sidhi/Demotix/Corbis

5

## 1 MOUNT BROMO

The much photographed view of the smouldering Mount Bromo surrounded by the Sea of Sand, with its rather serene neighbour Mount Batok and the mighty Mount Semeru as the southern backdrop, is one of the great iconic images of Indonesia.

## 2 MOUNT BATOK

If the steam rising from Mount Bromo puts you off, try neighbouring Mount Batok, a brown volcano near the centre of the caldera. Unlike the other peaks in the vicinity, it is no longer active.

## 3 TENGGERESE HOUSE

The homes of the Tenggerese, which are wonderfully coloured and immaculately tidy, are a must-visit for anyone interested in Tenggerese culture.

## 4 UPACARA KASODO FESTIVAL

The Upacara Kasada\*, held every year at the full moon of the 12th month of the Tenggerese calendar, is an authentic Tenggerese religious ceremony that invokes the approval of the gods in order to ensure a successful harvest, to be spared any natural calamities, and to be cured of disease.

\*Check the date of the next Upacara Kasada at the East Java Tourism Office in Surabaya (+62 31 567 7219).

## 5 MADAKARIPURA WATERFALL

This spectacular fall in the foothills of the park is easily reached by anyone visiting with their own transport. Legends abound here, and the cooling waters are said to be an elixir of life. The water is regarded as holy by the Tenggerese and is used in important ceremonies. The great Majapahit prime minister Gajah Madah is reputed to have meditated here.

5 During the era of the Majapahit Kingdom, its task force was lead by a great Commander named GajahMada, who, before his conquests, would meditate at this waterfall

### ALSO RECOMMENDED...

The Poten: The Tenggerese Hindu temple that looks eerily beautiful in the Sea of Sand close to Mount Bromo.

Lakes Ranupani and Ranu Regulo: Small, serene and always misty lakes, adjacent to the village of Ranupani on the south side of the crater.

# Top 5 products in Bromo

## 1 BROMO HAT

The most popular local product, at least based on the number of hawkers selling them, appears to be the Bromo hat, a colourful woolly hat with "Bromo" embroidered on it. Scarves and extra warm clothing are also popular and useful if you are not prepared for the cold mountain air.

## 2 JAVANESE COFFEE

Every lodge and hotel has an attached restaurant and there are few independent eateries. However, there are simple roadside *warungs* selling basic Indonesian dishes and IDR2,000 (15 US cent) mugs of hot Javanese coffee (*kopi panas*). There is no nightlife in the usual sense of the word, but all restaurants are open at 3am, as that is when everybody wakes to see the sunrise.

## 3 TRADITIONAL INDONESIAN DISHES

Waroeng Basuki, another nice eatery at Cemoro Lawang, serves traditional Indonesian dishes such as *tahu tek*, which is a simple tofu and bean sprout salad, and *rujak cingur*, a salad with a sweet and spicy sauce that contains slices of buffalo or cow lips.

## 4 MULLED WINE

The mulled wine served at some places in the evening seems to be heated *tuak* (a palm wine) with some local spices added. Only those with the strongest constitution should even consider this, and it is a very acquired taste!

## 5 APPLES

Near Nongkojajar village, there are red and green apples that are a must-try. Pay a visit to the nearby orchards offering these locally grown apples, which are so crunchy, it's hard to resist.



1



# DESCENDANTS OF THE MAJAPAHIT PRINCES

## SPOKEN FROM THE ISOLATED HIGHLAND REGION

The Tenggerese, or Tengger people, are an ethnic minority in East Java that claims to be the descendants of the Majapahit princes. Their population is centred on 30 villages in the isolated Tengger Mountains (Mount Bromo) within the Bromo Tengger Semeru National Park.

Scattered communities of Tenggerese also exist in the Pasuruan, Probolinggo, Malang, and Lumajang districts of East Java. The Tenggerese are considered an ethnic sub-group of the Javanese people. Before the 15th century, the history of the Tenggerese was linked with the Majapahit and other kingdoms from the earlier period.

The Tenggerese speak an archaic Javanese (Majapahit) dialect called Tengger Javanese. Elements of modern Javanese influences can be seen in their speech. They have their own written Kavi script based on the old Javanese Brahmi script.

Tengger Javanese is a minor dialect of Javanese spoken in the isolated highland region in and around the Bromo Semeru Tengger National Park in East Java. For centuries, the Tengger generally adhered to traditional Hindu-Javanese syncretic religious and cultural practices, and until recently remained relatively isolated from the Muslim Javanese populations in the lowlands.

The past 50 years, however, have seen increasing contact with the lowland Javanese, and with that pressure on the Tengger, both internal and external, to conform with both lowland religious and linguistic norms. A survey of Tengger villages conducted in the 1970s showed that 50 villages self-identified as Tengger, all following the traditional Hindu-Javanese ways.

When Thomas J. Connors from the Max Planck Institute for Evolutionary Anthropology conducted his fieldwork in 2003–4, that number had fallen to roughly 20 villages. In his paper, *Morphosyntactic Simplification in Tengger Javanese*, he described the diachronic development of verbal morphology in Tengger, which has undergone significant simplification both from the attested patterns of Middle Javanese, and shows signs of further reduction within the past 30 years.

Based on a comparison with a brief grammatical sketch of Tengger done by Smith-Hefner (1978), it is clear that in the past three decades or so, a number of salient verbal markers have undergone significant reduction in some cases (the propositive prefix), and complete loss in others (the intransitive marker *mer-* and the first and second person passive constructions).

These developments are the result of contact between Tengger Javanese and surrounding lowland dialects, demonstrated by the pattern in Malang Javanese, for example.

Source: *Morphosyntactic Simplification in Tengger Javanese*, Thomas J. Connors (Max Planck Institute for Evolutionary Anthropology), conference paper presented at Southeast Asia Linguistic Society XVI, Atma Jaya University, Jakarta, Indonesia (2006)

# PUBLIC HOLIDAYS IN BROMO

MAR  
9

TUESDAY  
Nyepi

Nyepi is observed as a “day of silence”, as it symbolically represents the state of the Universe before Creation. Principally celebrated by Bali’s Hindus, the Tenggerese also mark this important festival, which features numerous rituals and prayers (pujas). The rituals begin two days before Nyepi, and end the day after Nyepi, which is celebrated as New Year’s Day.

MAY  
21

TUESDAY  
Waisak Day  
(Buddha’s Birthday)

Waisak Day is a major event in the religious calendar for most Asian Buddhists, who celebrate the birth, enlightenment and death of Buddha on this day. Those who observe the religion use it as an opportunity to pay homage to the Enlightened One, seizing the opportunity to reiterate their devotion to principles of Buddhism: the determination to lead a noble life, the promise to develop their minds, the practice of love and kindness, and the striving for peace and harmony with humanity.

AUG  
17

TUESDAY  
Indonesian  
Independence Day

This day of festivities and celebrations marks the declaration of the country’s independence from the Netherlands. Indonesia declared its independence from the Dutch in 1945, but it wasn’t until 2005 that the Dutch government formally accepted the reality of the decision.





SOUTH AUSTRALIA

# SPIRIT OF THE LAND

THE RUGGED LURE OF COOBER PEDY

—  
*text*

DUNCAN MCLAREN

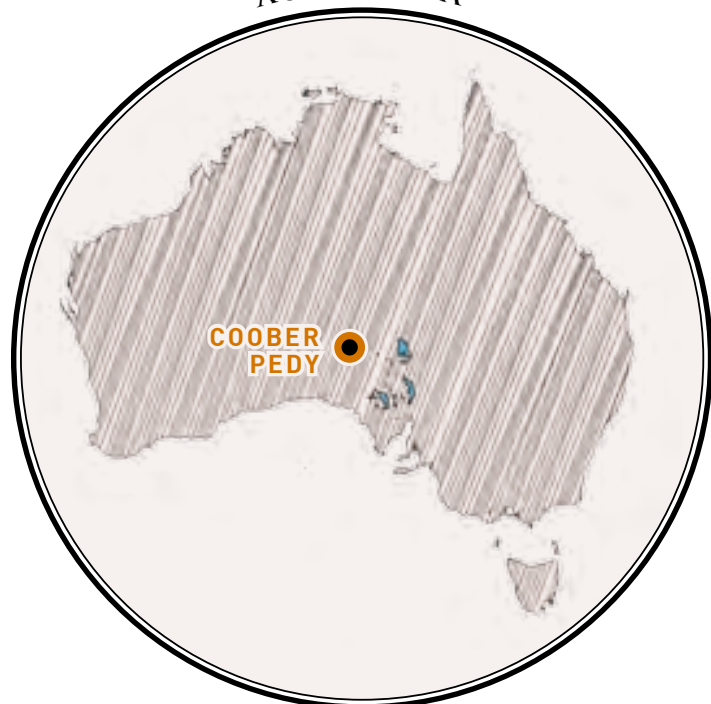




Around 850 kilometres north of Adelaide on the Stuart Highway, Coober Pedy is sometimes referred to as the “opal capital of the world”



## AUSTRALIA



### GETTING TO COOBER PEDY

#### FLIGHT INFORMATION:

Fly to Adelaide Airport on Singapore Airlines or Jetstar from Singapore Changi Airport, on Malaysian Airlines from KLIA, or on Qantas from Sydney. Rex Airlines flies from Adelaide to Coober Pedy, Sunday to Friday. Private charters are also available.

#### DRIVE:

Most people self-drive to and around the region. Many of the roads are sealed so you don't need a 4WD to see the key attractions. Always check road conditions before travel.

#### CAR HIRE:

As well as in Adelaide, hire car companies are available in Coober Pedy, Port Augusta, Port Pirie and Roxby Downs.

#### RAIL:

The famous "Ghan" railway line also runs nearby, linking Adelaide in the south to Darwin in the north – the world's longest rail route of its kind.

#### HOTELS:

Down to Earth  
[www.downtoearth.com.au](http://www.downtoearth.com.au)  
Opal Inn Hotel  
[www.opalinn.com.au](http://www.opalinn.com.au)  
Desert Cave Hotel  
[www.desertcave.com.au](http://www.desertcave.com.au)

#### CURRENCY:

Australian Dollar (US\$1 = AU\$1.36)

My favourite places in Coober Pedy are the public swimming pool in summer, the Breakaways Conservation Park, John's Pizza Bar and Restaurant, the Underground Bar at the Desert Cave Hotel, the Umoona Opal Mine and Museum, and most of all, my dugout where I live in comfort and style all year round.

The cultural element most influential on a day-to-day basis here is the sense of unrestrained freedom one feels when you live in the outback of Central Australia. The sense of freedom permeates everything you do and feel out here. In the city, one can feel constrained by the sheer number of people around you and hemmed in by the buildings and structures that surround you and block out the horizon. In the outback, you are constantly uninhibited by wide-open spaces and almost always have an unrestricted view of the horizon.

The element that speaks the loudest and influences art and design the most is the "dugouts". The rock-cut homes of Coober Pedy offer residents a secure and peaceful place to reflect and be inspired. Dugouts themselves can be an expression of the aesthetics of the person that created it, that then serves to inspire their creator in numerous other ways.



02

A "dugout", or a rock-cut home, is the most energy-efficient home design that one can possibly build. Despite the fact that I live in Central Australia with its infamous extremes of weather, I do not pay anything to heat or cool my home, all year round. So the first thing I love about my dugout is its financial benefits, adding to that its extremely low carbon footprint.

The second thing is, because they are so well insulated by thick, solid rock, dugouts are quiet – virtually soundproof. So I sleep soundly every single night, free of disturbances and awaken well rested every morning. The soundproof nature of the building also allows one to play music as loud as you like without disturbing anybody else.

Finally, I feel secure living in my dugout. Effectively, my dugout is like a well-appointed bunker, with 15–20 metres of solid rock surrounding me. A Boeing 747 could crash on my "roof" and I would be fine. No other type of home offers that level of security. There are other,

**02** The inland bearded dragon (*Pogona vitticeps*), a species of agamid lizard occurring in a wide range of arid to semiarid regions of Australia

**03** The Umoona Opal Mine & Museum, preserved from an actual old mine in Coober Pedy village







“*The culture of Coober Pedy is one of independence, pride and defiance in the face of adversity*”

**04** Sturt's desert peas grow beautifully in the Outback

**05** Coober Pedy has a desert climate: Between April and October, the weather is very mild. Typical of a semi-desert climate, the days are warm, but the desert nights are cool

**06** Quiet, cool, dark and airy: Most visitors say that sleeping underground gives them the best night's sleep they have ever had!

#### DID YOU KNOW?

### COOBER PEDY: 100 YEARS OF HISTORY

In 1915, the New Colorado Gold Prospecting Syndicate, consisting of Jim Hutchison, his 14-year-old son William, together with Winch and McKenzie had been unsuccessfully prospecting for gold out in the middle of nowhere in South Australia.

The young lad, Willie, had been left in camp to look after their supplies, but disobeyed orders and wandered off to search for water around the foothills of a nearby range. There was a degree of apprehension among the men when he failed to turn up after dark. But a short time later, he strode into camp with a grin on his face. Over his shoulder was slung a sugar bag full of opals. Not only did he come across the opals, but he also discovered something equally precious – a supply of fresh water.

On February 1, 1915, they pegged the first opal claim. The catalyst for Coober Pedy's existence had been discovered.

Carl & Ann Purcell/Corbis



Paul A. Souders/Corbis

05







06

less tangible reasons I love my dugout, but they are harder to express and have a lot to do with spirituality or the pervasive feelings of peace and calm.

It was at John's Pizza Bar and Restaurant where I made my first friend in Coober Pedy, and it was there about two weeks later when I realised that I would like to stay in Coober Pedy and never go back to Sydney. I felt truly calm, relaxed and happy for the first time in my life and from the moment that I made that decision, I have never regretted it.

The culture of Coober Pedy is one of independence, pride and defiance in the face of adversity. The citizens of Coober Pedy do not give up easily and pursue their dreams; no matter how "crazy" those dreams might seem to others. In my experience, the people out here are prepared to innovate and invent far more readily than people who live in the big cities.

The Breakaways Conservation Park is an amazingly scenic location with a strong, spiritual vibe – a pristine location with wildflowers, native animals and surrealistic vistas. I love to go out there and just absorb the peace and connection to the land.

The greatest pride in Coober Pedy can be felt by the fact that everything you see out here has come from nothing but the hard work and courage of the town's residents. Very little of what you see in town has been provided by the government over the past century, but rather, has been built by residents with a vision to make this place a special sanctuary in the middle of nowhere and the courage to stay here, put up with adversity, and make their vision a reality. **AGP**

## DUNCAN MCLAREN



Duncan McLaren is an Australian who moved to Coober Pedy from Sydney nine years ago with the goal of one day building his own dugout. He works for the District Council of Coober Pedy as the Tourist Information Officer and is responsible for the day-to-day operation of the town's Visitor Information Centre. He enjoys finding opal, as well as cutting, polishing and setting opal into handcrafted pieces of jewellery. He loves living in Coober Pedy and is about to commence work on the dugout that he came here to build nearly a decade ago.



# Top 5 products in Coober Pedy



Opal stones, the national gemstone of Australia

Chen Xiaowei/Xinhua Press/Corbis

## 1 OPAL

As the “Opal Capital of the World”, it seems a shame to come to Coober Pedy and leave without buying, or finding, a piece of opal to take with you. Coober Pedy has more opal shops than anywhere else on Earth, so anyone can find a bargain here if they shop around.

## 2 T-SHIRTS

A T-shirt that says Coober Pedy on it will always remind you of your time here and will show others that you have been to one of the most unique little towns in Australia.



3

## 3 ABORIGINAL ART

Indigenous art has its own local style, and visitors will be struck by the beauty and variety of local indigenous art. Anyone visiting the region should think seriously about purchasing one of these original and stunning pieces of art created by a local indigenous artist.

## 4 “ZEBRA-STONE” CARVED SCULPTURE

Another example of Coober Pedy’s unique geology is a stone known locally as “Zebra Stone”. Zebra Stone is a fine-grained siltstone like alabaster, but it is permeated by iron-rich water so it is multicoloured and patterned. Local artisans carve this stone into interesting abstract shapes that make unique and fascinating sculptures.



Light aircraft flying over Lake Eyre National Park

Nature Connect/Corbis

5

## 5 CHARTERED FLIGHT OVER LAKE EYRE

Whether it has water in it or not, the massive saltpan systems of Lake Eyre are a must-see from the air. Flying over Lake Eyre is the only way one can perceive the impossible scale of this impressive natural feature.

## PUBLIC HOLIDAYS IN COOBER PEDY

JAN  
1

FRIDAY  
New Year’s Day

Due to its geographical position close to the International Date Line, Australia is one of the first countries in the world to welcome the New Year.

JAN  
26

TUESDAY  
Australia Day

Australia Day commemorates the establishment of the first European settlement at Port Jackson, now part of Sydney, in 1788.

MAR  
14

MONDAY  
Adelaide Cup

The Adelaide Cup is a state holiday in South Australia that falls on the second Monday of March. The horse-racing event has been the heart of South Australia’s sporting and social life since it was first run in 1864.

MAR  
28

MONDAY  
Easter Monday

Easter Monday is the day after Easter Sunday. It is a public holiday throughout Australia.

DEC  
28

WEDNESDAY  
Proclamation Day

This unique day to South Australia celebrates the establishment of government in the state as a British province. The proclamation, which specified the same protection under the law for the local native population as for the settlers, was made by Captain John Hindmarsh beside the Old Gum Tree in the present-day suburb of Glenelg North on December 28, 1836.



# “WHITE MAN IN A HOLE”

## A VARIETY OF THE WESTERN DESERT LANGUAGE

Text Alvin Tan

In the local aboriginal dialect, Coober Pedy, the name given to the opal mining town that emerges out of nowhere on the Stuart Highway – the long desert road between secular Adelaide and mystical Ayers Rock in South Australia – means “White Man in a Hole”.

When Coober Pedy was founded after the first opal discovery in 1915, it was with the zeal and promise of the gold rush of the American Wild West. Immigrants came from Europe after World War II in larger numbers looking for a post-apocalyptic utopia. They all got rich and built the community that has remained relatively unchanged since (though the current town infrastructure was dug out of the desert rock in 1960); a population of approximately 45 nationalities that hovers around 3,500 people.

The official census doesn’t count a fluctuating margin of several hundred drifters that arrive for Opal Season, which kicks off at Easter and ends in November, or those who come to Coober Pedy to evade society, the law or other undesired attentions, or who live here but don’t speak English and prefer not to be counted as official residents.

Yankunytjatjara (also Yankuntatjara, Jangkundjara, Kulpantja) is an Australian Aboriginal language, one of the Wati languages, which belong to the large Pama–Nyungan family. It is one of the many varieties of the Western Desert language.

Yankunytjatjara is spoken in the northwest of South Australia and is one of the most easterly of the Western Desert dialects, being spoken around the communities of Mimili, Indulkana and Fregon and across to Oodnadatta and Coober Pedy, although the latter is not on Yankunytjatjara land, but rather on traditional Arabana lands.

One of the many dialects of the Western Desert language, Yankunytjatjara is very similar to the better-known, more widely spoken Pitjantjatjara. According to a study carried out mainly in Coober Pedy, where many speakers of both varieties reside, young speakers of Yankunytjatjara often borrow words from English and also from Pitjantjatjara (which has expanded eastwards into Yankunytjatjara country and beyond). Yankunytjatjara shows some variation across its range with, for example, Northern Yankunytjatjara sharing features with Southern Luritja.

The name used for Yankunytjatjara is based on a single prominent word, the verb for “come/go”, which distinguishes it from its near neighbour, Pitjantjatjara. The latter has **pitjantja** (in the present tense **pitjanyi**) for this verb while Yankunytjatjara has **yankunya** (present tense **yananyi**). The ending **-tjara** is the comitative suffix, and means, “having” or “with”. Thus **Yankunytjatjara** means, “to have **yankunytja**”, as opposed to **Pitjantjatjara**, which has **pitjantja**.

The name “Coober Pedy” comes from the local Aboriginal term *kupa-piti*, which means, “white man’s hole”



Carl & Ann Purcell/Corbis

Alternatively, the northernmost Yankunytjatjara and parts of Southern Luritja both have the word **matu** (true) and so are sometimes grouped together as Matutjara to contrast them with the Southern Yankunytjatjara, which uses **mula** for “true” and so can be referred to as Mulatjara. Another classification used by speakers groups Yankunytjatjara and Pitjantjatjara together as Nyangatjatjara, as they both use **nyangatja** for the demonstrative “this” or “this one”; this contrasts them with Ngaanyatjara, which has **ngaanya** for the demonstrative, and Nyanganyatjara varieties (still further west), which have **nyanganya**.

The name *Yankunytjatjara* is usually pronounced (in normal, fast speech) with one of the repeated syllables **-tja-** deleted, thus: *yankunytjara*. In slow, careful speech, all syllables are pronounced.



*Lying in the Pacific Ring of Fire,  
the Maluku Sea has revealed to  
me many unique creatures as yet  
unknown to science.*

WILLIAM TAN

Section First Violin, Singapore Symphony Orchestra

“

”







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